POLYCLIM 21A
+ Timer + Fog

User's Manual

1. GENERAL PRESENTATION

1.1. Functions

The device is designed to manage the climate in your greenhouses and horticultural or market gardening tunnels and provides the following functions :

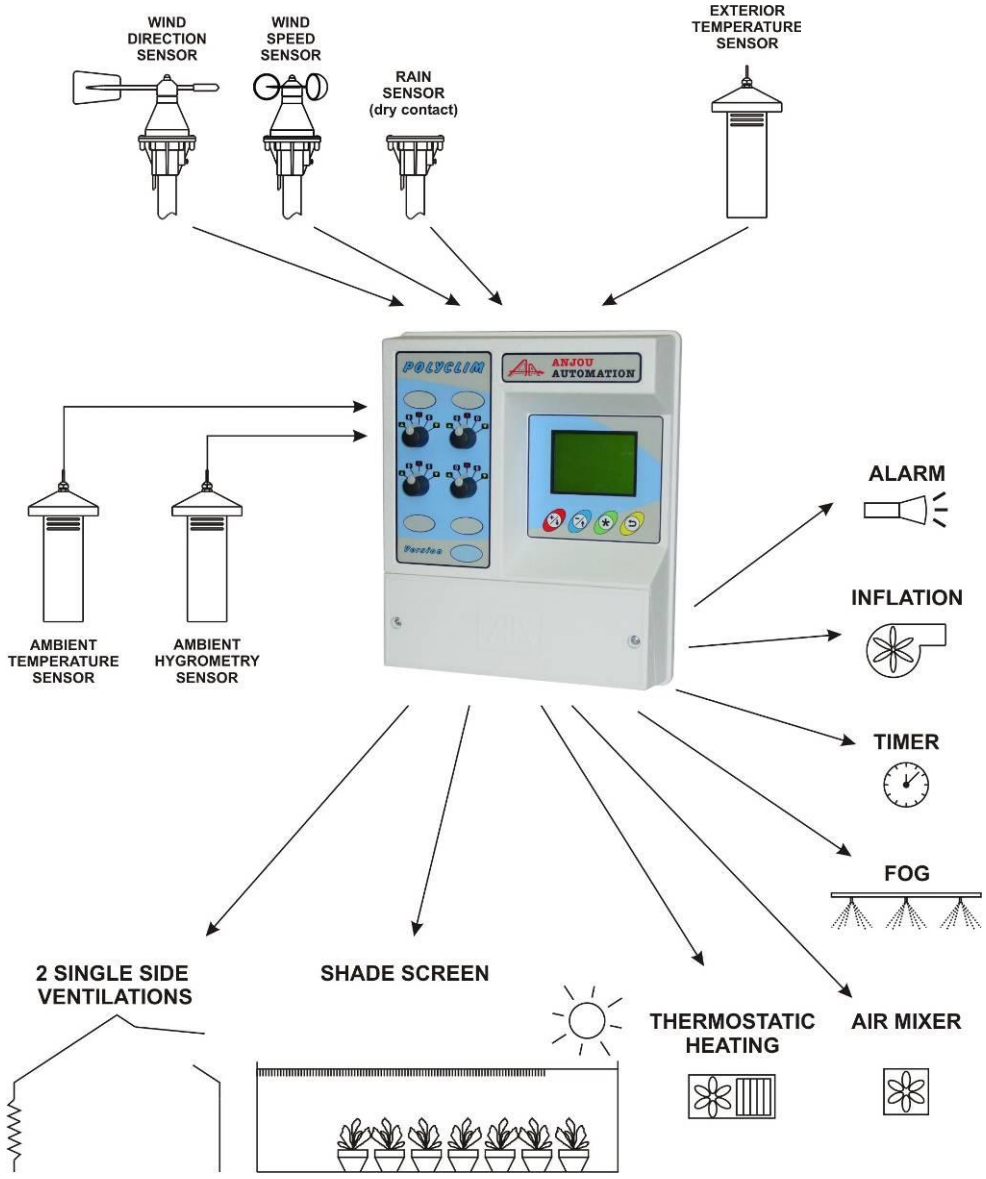
- Control of 2 independent single side vents.
- Control of a shade curtain (Or thermal screen).
- Control of thermostatic heating.
- Control of dehumidification.
- Control of an inflation system.
- Control of a timer system.
- Control of a fog system.
- Control of alarms (With control output).

and in option :

- archiving.
- « 4 periods » management.

installation safety (refer to § 5.2)

1.2. General diagram



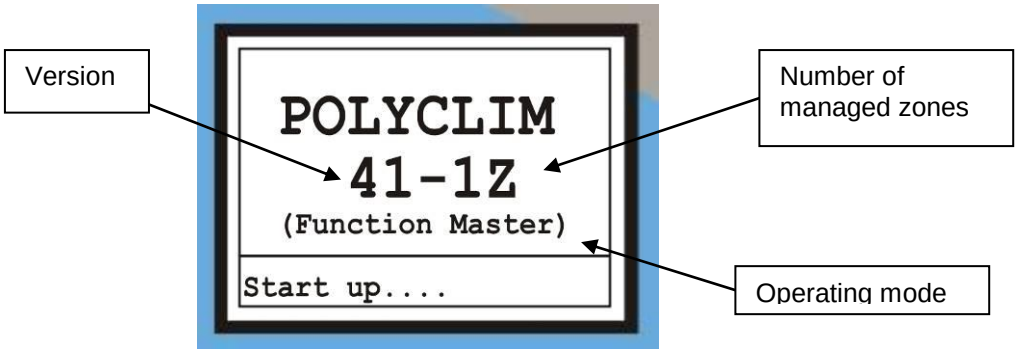
2. USE OF THE DEVICE

2.1. Browsing

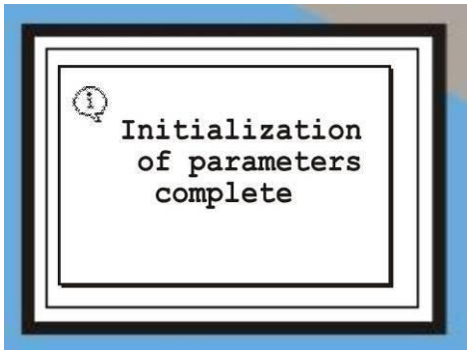
For information display, menu browsing and parameter setting, regulator has:

- a 28x64 pixel graphic screen
- 4 keys : ⊘ ⊕ ✱ ⊃
- 4 five-way selector switches of the type "Open - Stop - Auto - Stop - Close"

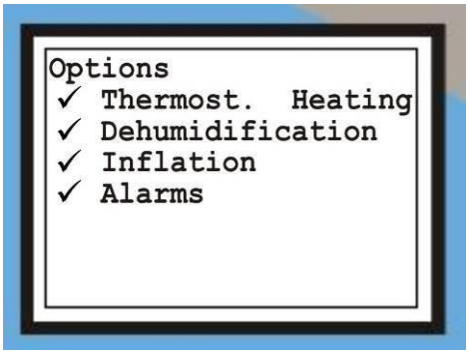
Start-up screens:
When the power is switched on, the regulator displays the version and operating mode. For example :



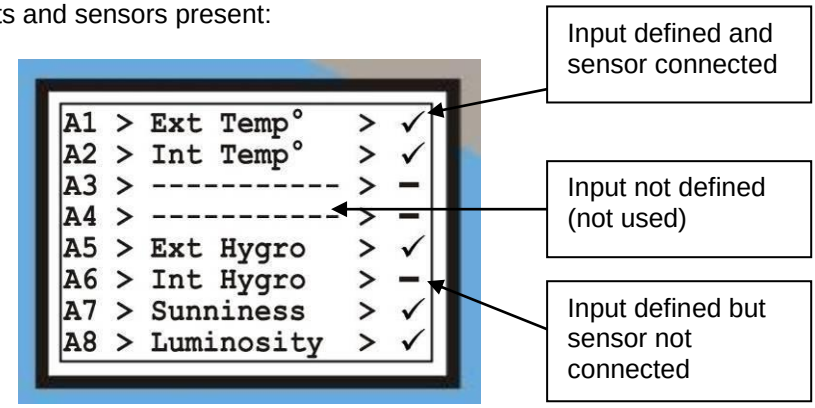
Note : During the start-up phase, it is possible to reinitialize **all** the parameters by pressing the keys ⊕ and ⊘ simultaneously. The following screen appears:



then the program options :



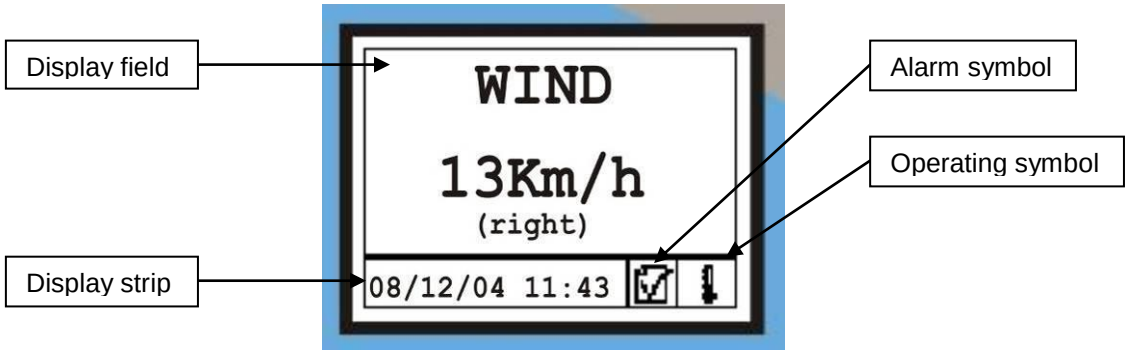
and the configuration of inputs and sensors present:


A1 > Ext Temp° > ✓
A2 > Int Temp° > ✓
A3 > ---------- > –
A4 > ---------- > –
A5 > Ext Hygro > ✓
A6 > Int Hygro > –
A7 > Sunniness > ✓
A8 > Luminosity > ✓
Input defined and sensor connected
Input not defined (not used)
Input defined but sensor not connected

The followings sensors can be defined:

Label on screen	*Type of sensor*
`Int Temp°`	Interior temperature (ambient)
`Water Temp°`	Heating water circuit temperature
`Soil Temp°`	Soil (ground) temperature
`Ext Temp°`	Exterior temperature
`Int Hygro`	Interior hygrometry (ambient)
`Ext Hygro`	Exterior hygrometry
`Sunniness`	Solar power (Watt/m²)
`Luminosity`	Light intensity (Lux)
`Wind vane`	Wind vane 0/360°
`CO2`	CO2
`Rain`	Rain (4/20 mA output)

Screen fields and symbols:



- *The display field* is used to display all the information for menu browsing, messages, parameter setting, etc.
- *The display strip* is used to display the date and time, as well as scrolling messages or information during browsing.
- *The alarm symbol* is one of two icons indicating whether or not an alarm is present (current or stored).

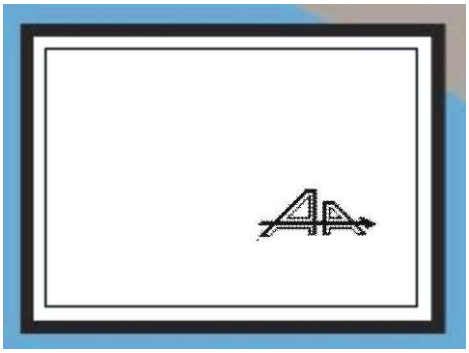
☑ ➔ no alarm

🔔 ➔ alarm present

- *The operating symbol is a moving thermometer showing that the regulator is active.*

Home screen:
After the start-up phase, the regulator displays various screens in alternation, depending on the version and sensors connected (wind speed, solar power, temperature, etc.). For example:

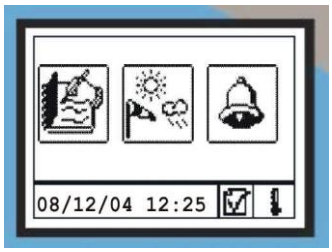
Screen saver:
To preserve the screen and increase its life, the regulator switches automatically to "saver" mode after a given time. The information disappears, any changes made to the parameters are saved and a small logo moves around the screen:



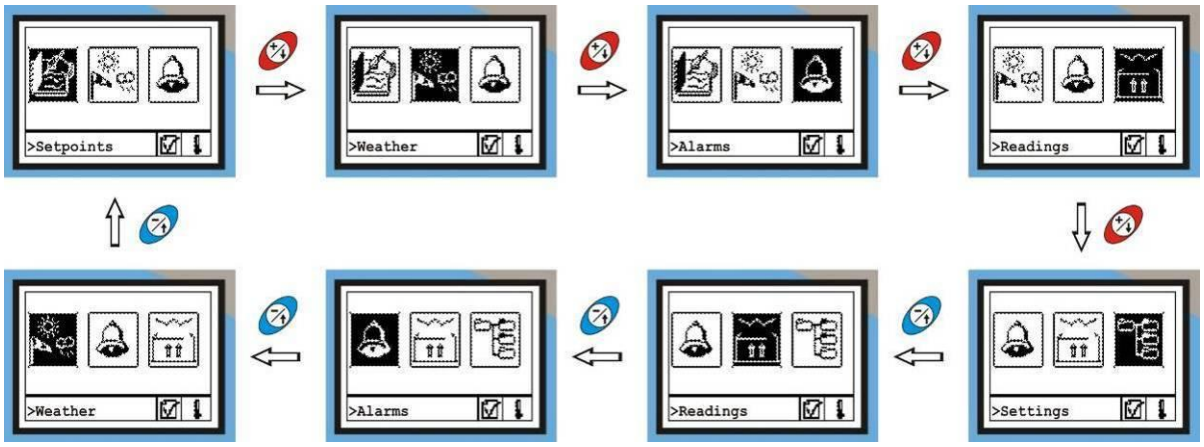
The home screen reappears as soon as a key is pressed.

Icon screen:

This icon screen is accessed by pressing any key on the home screen. It is used to open the menus in order to modify parameters, read values, etc.



To move around, use the key ⊕ to go to the right and the key ⊖ to go to the left. For example:



To run the action represented by the icon, press the key ✱
To return to the home page, use the key ⮌

The icons are as follows:

➔ access to the "Setpoints" menu
(= main setpoints)

➔ access to the "Weather" menu
(= weather settings)

➔ access to the "Alarms" menu
(= list of stored alarms)

➔ access to the "Readings" menu
(= reading of sensors, control status, etc.)

➔ access to the "Settings" menu
(= setting of parameters other than setpoints)

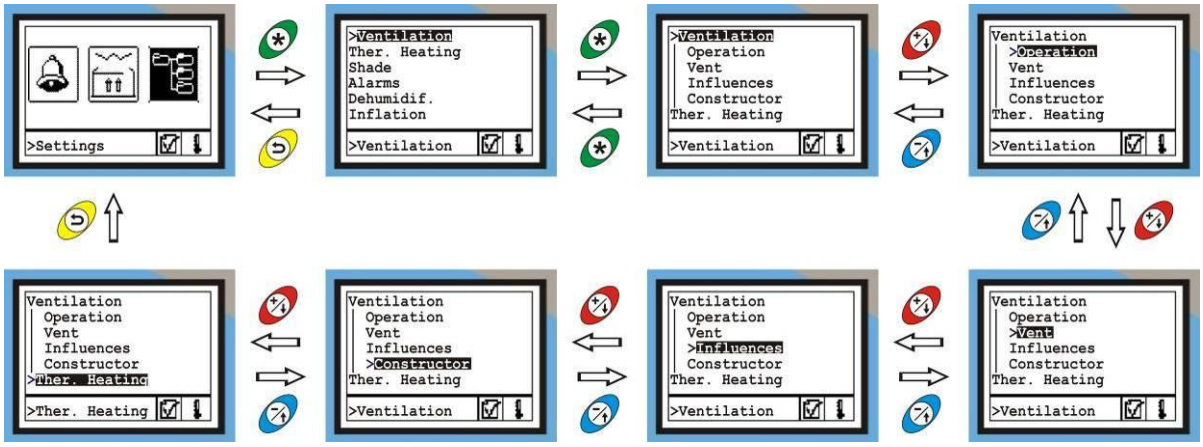
➔ access to the "Installation" menu
(= calibration of sensors, maintenance)

➔ access to the "Date and Time" menu
(= setting of the system date and time)

➔ access to the "System" menu
(= language setting, etc.)

Note : The symbol 🔒 means that the menu opens after a long press on the icon.

Scrolling menu screens:
The scrolling menus are accessed via the icons and are used to choose the parameters to be set from a list with several levels.
For example:



To move around, use the key ⊕ to move down and the key ⊖ to move to up. To run the action shown on the menu (expand or reduce a level, open a parameters menu, etc.) use the key ✱

The key ⮌ can be pressed at any time to return to the previous screen (icons).

Parameter menu screens:
The parameter menu screens are accessed from the icons or scrolling menus and are used to select a given parameter from a list in order to modify its value.
For example:

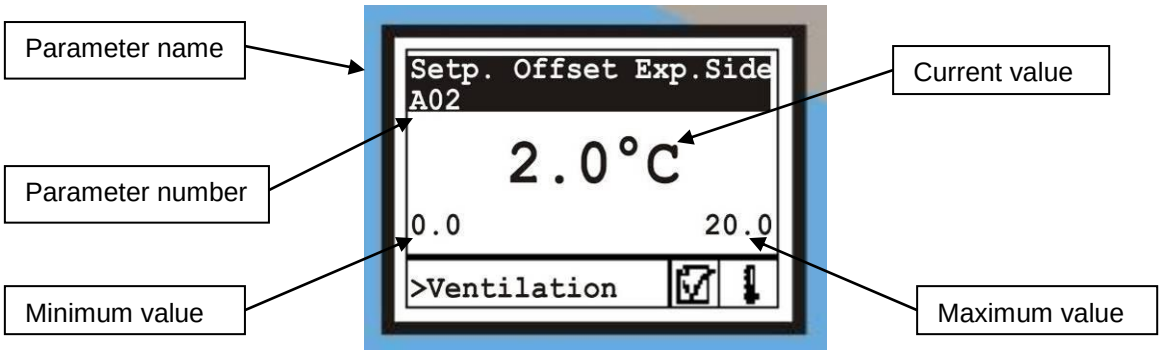
To move around, use the key ⊕ to move down and the key ⊖ to move to up. To access setting of the selected parameter, use the key ✱

To return to the previous screen at any time, use the key ⮌

Parameter setting screen

After browsing through the menus and choosing a parameter, it is possible to modify its value.

For example:



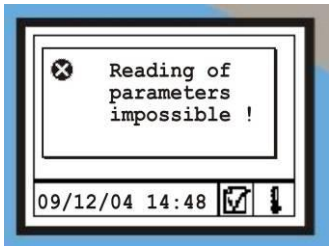
To change the value, use the key ⊕ to increase and the key ⊖ to decrease. The minimum and maximum values indicate the limit values of the parameter.

To validate and save the parameter setting, use the key ✱

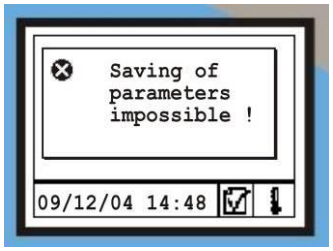
To cancel the parameter setting and return to the previous screen (parameters menu), use the key ⮌

Error or information screens

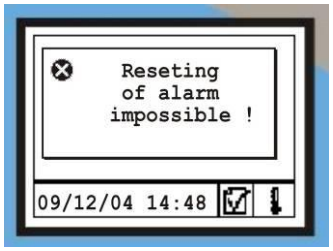
If there is a problem, the regulator displays information screens such as:



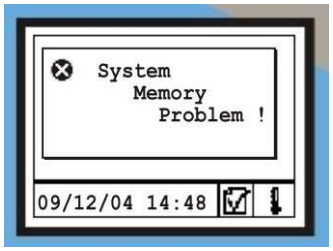
The regulator cannot read the parameters
➔ battery or memory problem



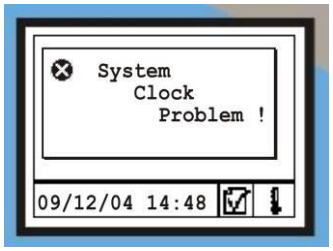
The regulator cannot save the parameters
➔ memory problem



The regulator cannot acknowledge an alarm
➔ memory problem or alarm not recognized



The regulator cannot create menu or alarm lists
➔ memory problem



The regulator cannot read the time
➔ problem with real-time clock component

To solve any problems, proceed as follows in every case:

1. Cut off the power supply for around ten seconds
2. Restore the power to the device
3. Repeat the operation that seems to have caused the problem
4. If the problem persists, contact the retailer of the device.

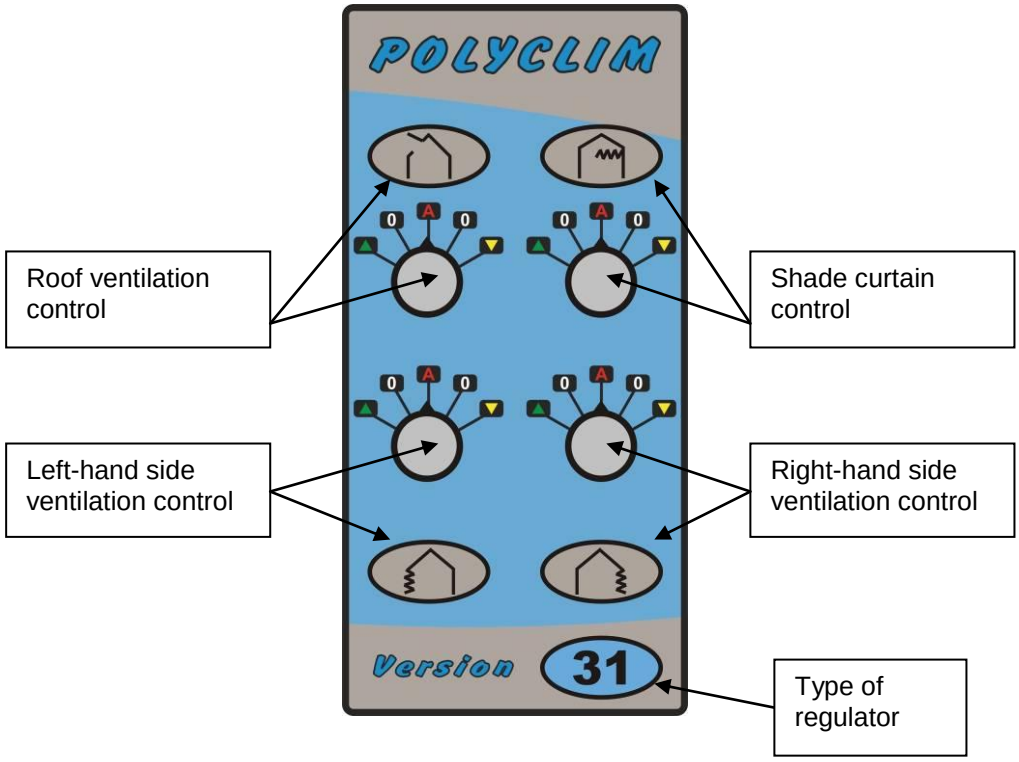
2.2. Integrated manual operation

Depending on the version, the regulator has:

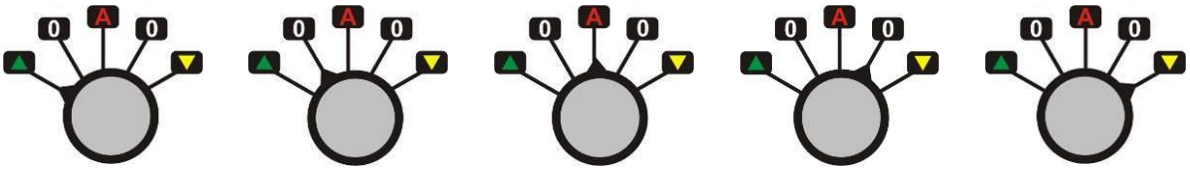
- 1, 2, 3 or 4 five-way selector switches of the type "Open - Stop - Auto - Stop - Close"
- 1 two-way switch of the type "Auto – Override"

Five-way selector switches

E.g. for the regulator 31 (3 ventilation switches, 1 shade switch)



The various selector switch positions:

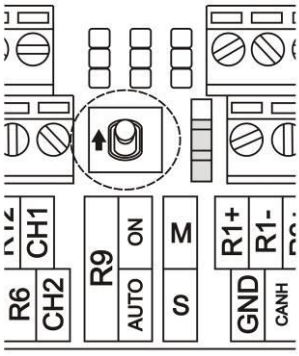


Manual « Open » | Manual « Stop » | Automatic | Manual « Stop » | Manual « Close »

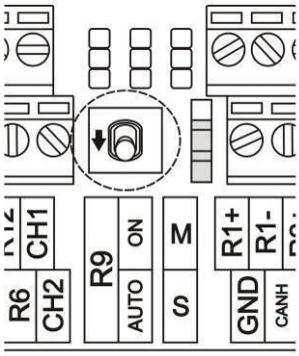
The selector acts directly on the regulator outputs.
When a selector is set to "Manual" (open, close or stop), the regulator no longer monitors the function concerned (e.g. roof ventilation). On switching back to "Automatic", the regulator automatically resets the function concerned.

Two-way switch
The two-way switch is used to control inflation and is located inside the case between the input and output terminal blocks.

The various positions of the switch:



« On » : Override



« Auto » : Automatic

The switch acts directly on the R9 output of the regulator.
When the switch is set to "Override", the regulator no longer monitors the function concerned (e.g. inflation). On switching back to "Automatic" position, the regulator restarts the inflation cycle on an interval.

2.3. General Parameters

2.3.1. Date and Time

Date and Time Menu

WA01	System Time

Internal time of the device
This is the time used by the device for the various regulation functions

Min : ***00.00***
Max : ***23.59***
Default : ***12.00***

WA02	System Date

Internal date of the device
This is the date used by the device to record events such as alarms

Min : ***01/01/2005***
Max : ***31/12/2099***
Default : ***01/01/2005***

WA03	Summer/Winter Auto.

Automatic management of the hour summer/winter
Allows an automatic adjustment of the hour at the time of the passage of summer to winter (–1h at the end of October) and of winter to summer (+1h at the end of March)

Min : ***NO***
Max : ***YES***
Default: ***YES***

2.3.2. Sensor Calibration and Maintenance Mode

- For each sensor, it is possible to apply a correction to the measurement made by the device.

Installation Menu ➔ Calibration

YA01	Sensor name

The title depends on the sensor defined on the analogue input (see start-up screen)

Min :
Max :
Default :

The minimum and maximum values change for each type of sensor as shown in the table below

Sensor type	*Min*	*Max*
Temperature	-5.0 °C	+ 5.0 °C
Humidity	-10 %	+ 10 %
Sunlight	-100 Watt/m²	+100 Watt/m²
Light intensity	-1000 Lux	+1000 Lux
Wind vane 0/360°	-50 °	+50 °
CO2	-100 ppm	+100 ppm

ON/OFF type sensors cannot be calibrated.
For example: Wind speed sensor, 2-sides wind vane, Rain, etc.
(measurement correction not possible for these sensors)

- The "Maintenance" menu is used only to test the regulator outputs in order to check that the controls (ventilation, heating, etc.) are correctly connected

Installation Menu ➔ Maintenance

When this menu is displayed, all regulation functions are inhibited.
➔ ventilation, heating, etc. are no longer monitored in automatic mode.

YX01	Output to activate

Output that the operator wishes to activate
Used to select the output to be activated in maintenance mode (see section "Power supply and output connections).

Min : ***None***
Max : ***R12***
Default : ***None***

The selected output is activated as soon as this menu is displayed
➔ after exiting from this menu, the regulator reinitializes all the regulation functions (readjustment of air vents, etc.) and resumes in automatic mode.

2.3.3. System

System Menu ➔ Settings

XA01	Language

Language currently used
Used to modify the language of all titles

Min :
Max :
Default : ***French***

XA02	Operating Mode

General operating process
Allows to activate or not certain adjustments in other menus, in particular related on the weather influences and automatic calculations of the hours of sunrise and sunset

Min : ***SIMPLE***
Max : ***EXPERT***
Default: ***SIMPLE***

XA03	Latitude

Latitude of geographic point
Latitude of the site where the regulator is installed intervening in the calculation of the hours of sunrise and sunset

(1)
Min. ***90° S***
Max. ***90° N***
Default ***47° N***

XA04	Longitude

Longitude of geographic point
Longitude of the site where the regulator is installed intervening in the calculation of the hours of sunrise and sunset

(1)
Min. ***180° W***
Max. ***180° E***
Default ***0°54' W***

XA05	GMT Hour

GMT Hour
Shift compared to GMT hour of the site where the regulator is installed intervening in the calculation of the hours of sunrise and sunset

(1)
Min. ***-12h***
Max. ***+12h***
Default ***+1h***

XA06	**Winter/Summer time**		**(1)**
Winter/Summer time		Min.	***NO***
Taking automatically into account of Winter/Summer time.		Max.	***YES***
		Default	***YES***

XA07	**Screen Saver Delay**		
Screen saver delay		Min :	***30 s***
Minimum screen hold time before switching to "screen saver" mode		Max :	***999 s***
(set a value of 1000 to prevent switching to screen saver mode)		Default :	***600 s***

XA08	**Network Address**		
Address of the regulator on the network		Min :	***1***
Number of the regulator used to network the device with a		Max :	***99***
supervision system.		Default :	***1***

Notes : Parameter visible

(1) If "XA02" is set to "Expert"

System Menu ➔ Version & Date

Menu in read mode only (no setting)

XB01	Polyclim Type

Type of regulator
Provides information about the type of regulator

XB02	Version

Version of the regulator
Provides information about the regulator program version

XB03	Date

Date of the regulator
Provides information about the date of the regulator program

XB04	Configuration Number

Configuration Number
Provides information about the configuration of the regulator

System Menu ➔ Input Config.

Menu in read mode only (no setting)

XC01	Sensor name

Indicates whether or not a sensor is present when switching on

The parameter number corresponds to the analogue input. For example:
XC01 corresponds to input A1,
XC01 corresponds to input A2,
Etc.

System Menu ➔ Option Config.

Menu in read-only mode (no setting)

XD01	Option name

Provides information about the options managed by the regulator

For example: "Thermostatic heating", "Dehumidification", "Air Mixer", etc.

3. FUNCTIONS

3.1. Weather detection

3.1.1. Principle

Several safety systems are possible, depending on the sensors connected to the controller.

- **Wind speed**

The measured wind speed the degree of vent closing.

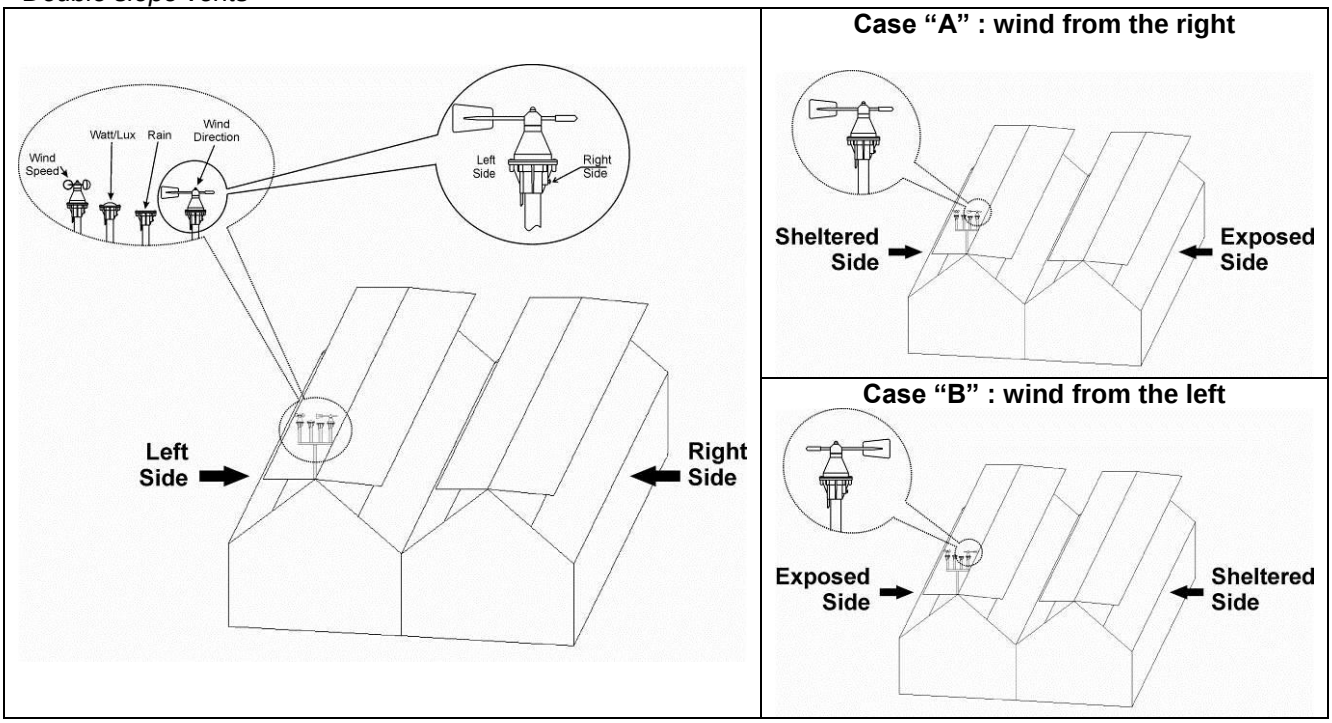
- **Wind direction**
  - **Two directions wind vane**

A two directions wind vane is sufficient when all compartments and vents of the installation are directed in the same way.

The screw of the 2D vane by convention is called the right side.

In the case of a single slope vents, a parameter permit to define if the vent physically is located at the right or left side of the wind vane.

Double slope vents

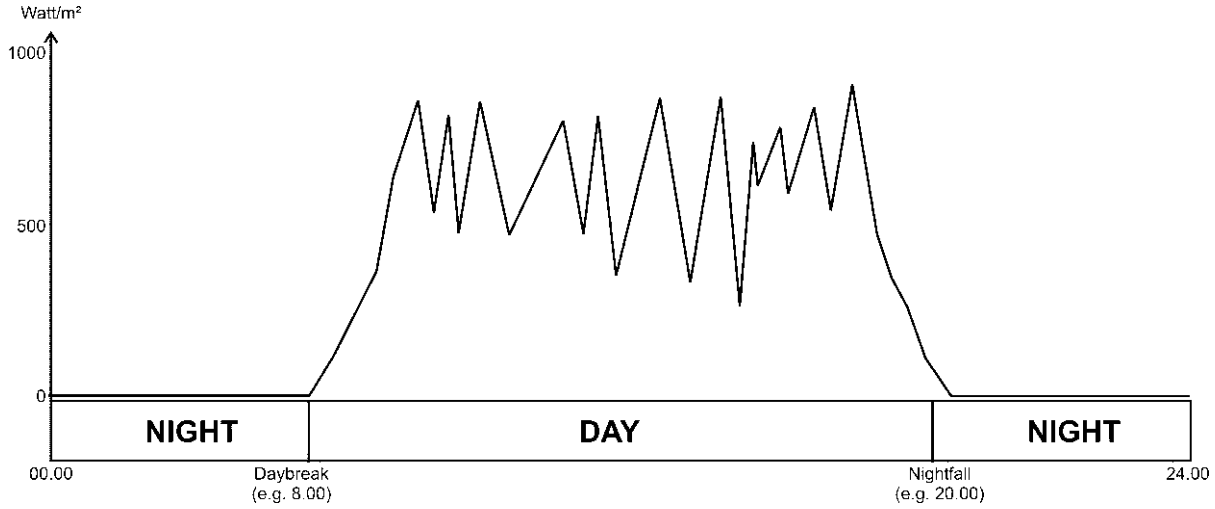


Rain

Rain also determines vent closing. The degree of closing depends on the ventilation settings on the sheltered or exposed side.

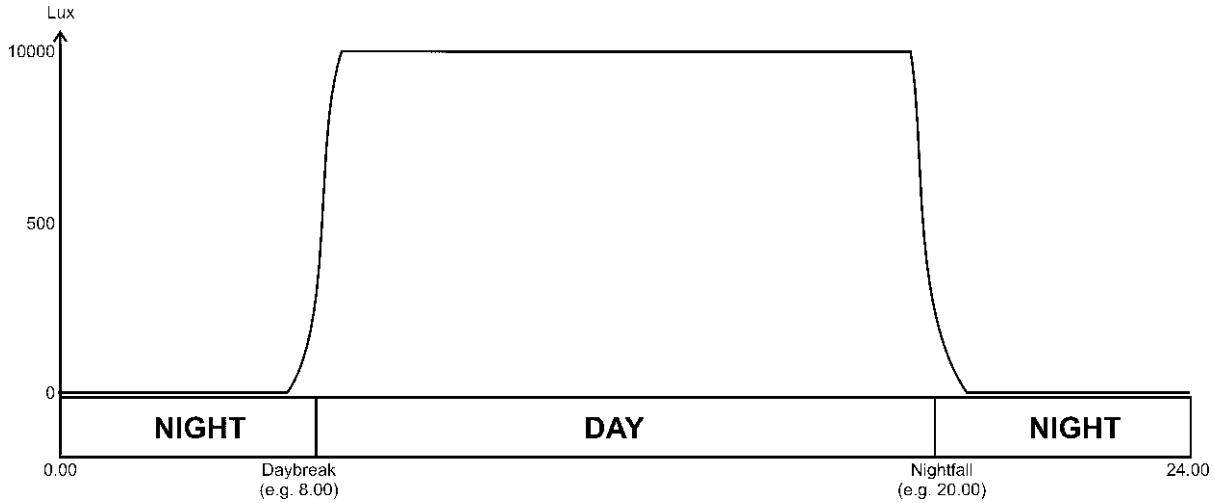
- **Sunniness**

The power of the sun, measured in Watt/m², is used during the day to control opening and closing of the shade curtain in order to protect the plants in the greenhouse against excessive solar radiation. Under a bright sun, solar power may reach 1000 Watt/m², but reduces as soon as a cloud appears. The sunlight curve for a cloudy day may look like this:



- **Luminosity**

Light intensity is measured in Lux and is used to automatically detect the Day and Night periods. A typical light intensity curve might be:



At the same time, light intensity can also be used to control when the greenhouse lamps switch on to artificially "extend" the length of the day and give the plants more light.

If the light intensity sensor is not connected, the day and night start times can be set "manually" by two parameters.

3.1.2. Parameters

Notes :

- the symbol means that the menu opens after a long press
- in some cases parameters may be masked; see the corresponding notes at the end of the list of parameters

Weather Menu ➔ Setpoints

BA01	Light Wind Threshold		
Speed at which a light wind is detected Wind speed at which the controller begins to limit the opening of the vents in ventilation position		Min : Max : Default :	***0 km/h*** ***BA02*** ***30 km/h***

BA02	Strong Wind Threshold		
Speed at which a strong wind is detected Wind speed at which the controller closes the vents fully.		Min : Max : Default :	***BA01*** ***100 km/h*** ***50 km/h***

BA03	Wind Threshold Number		
Number of wind thresholds Value indicating how many thresholds the controller must take into account between the light and strong wind thresholds		Min : Max : Default :	***1*** ***10*** ***1***

BA04	Wind Threshold Tempo		(1)
Wind threshold temporizing Amount of time the controller must wait before considering that a threshold has changed		Min : Max : Default :	***0 min*** ***99 min*** ***5 min***

BA05	Lux Threshold (D/N)		(2)
Lux threshold for Day / Night detection Measured Lux value above which the controller must operate in "Day" mode and below which it must operate in "Night" mode		Min : Max : Default :	***0 Lux*** ***9999 Lux*** ***600 Lux***

BA06	Lux Temporizing (D/N)		(2)
Day/Night detection temporizing Amount of time the controller must wait before considering that the light intensity has changed		Min : Max : Default :	***0 min*** ***30 min*** ***5 min***

BA07	Start of Day Time		(3)
Start of day time Time from which the controller must operate in "Day" mode		Min : Max : Default :	***0h00*** ***BA08*** ***8.00***

BA08	Start of Night Time		(3)
Start of night time Time from which the controller must operate in "Night" mode		Min : Max : Default :	***BA07*** ***23h59*** ***20h00***

Weather Menu ➔ Constructor

BX01	Rain/Wind Det. Delay

Rain or wind detection delay
Minimum time before a weather phenomenon (rain or wind) is taken into account by the controller

Min : ***0 s***
Max : ***30 s***
Default : ***5 s***

BX02	Wind/Rain Stop Delay

Delay in detecting end of rain or wind
Time lag between the end of the weather phenomenon (rain or wind) and the time when the controller acts on this information

Min : ***0 min***
Max : ***30 min***
Default : ***2 min***

BX03	Wind Speed Side Chang

(4)

Wind speed for wind vane to change side
Minimum wind speed for wind vane to be taken into account

Min : ***0 km/h***
Max : ***30 km/h***
Default : ***15 km/h***

BX04	Delay Side Change

(4)

Time-delay for wind vane side change
Time during which the wind vane must remain stable on one side with minimum wind speed in order for this side to be taken into account

Min : ***0 s***
Max : ***999 s***
Default : ***300 s***

Notes : Parameter visible

(2) If "BA03" is greater than 1

(3) If the light intensity sensor (Lux) is connected

(4) If the light intensity sensor (Lux) is not connected

(5) If the controller is in "Master" mode

3.1.3. Reading screens

Reading Menu ➔ Sensors ➔ Interior

1.	Air Temp° > +xx.x°C
2.	Water Temp° > +xx.x°C
3.	Soil Temp° > +xx.x°C
4.	Hygrometry > xxx%
5.	Sunniness >xxxxW/m²
6.	CO2 >xxxxxppm

1. Measured ambient temperature (--- °C if not detected at start-up)
2. Measured circuit temperature of 3WV (--- °C if not detected)
3. Measured soil temperature (invisible if not detected)
4. Measured ambient hygrometry (--- % if not detected)
5. Measured inside sunniness (invisible if not detected)
6. Measured CO^2 rate (invisible if not detected)

Reading Menu ➔ Sensors ➔Exterior

1.	Wind >xxxKm/h xxxxxx
2.	Rain > xxx
3.	Ext. Temp° > +xx.x°C
4.	Ext. Hygro > xxx%
5.	Sunniness > xxxxW/m²
6.	Luminosity >xxxxxxLux

1. Measured wind speed and direction
2. Rain presence (yes or no)
3. Measured outside temperature (--- °C if not detected at start-up)
4. Measured outside Hygrometry (--- % if not detected)
5. Measured outside sunniness (----W/m² if not detected)
6. Measured outside luminosity (-----Lux if not detected)

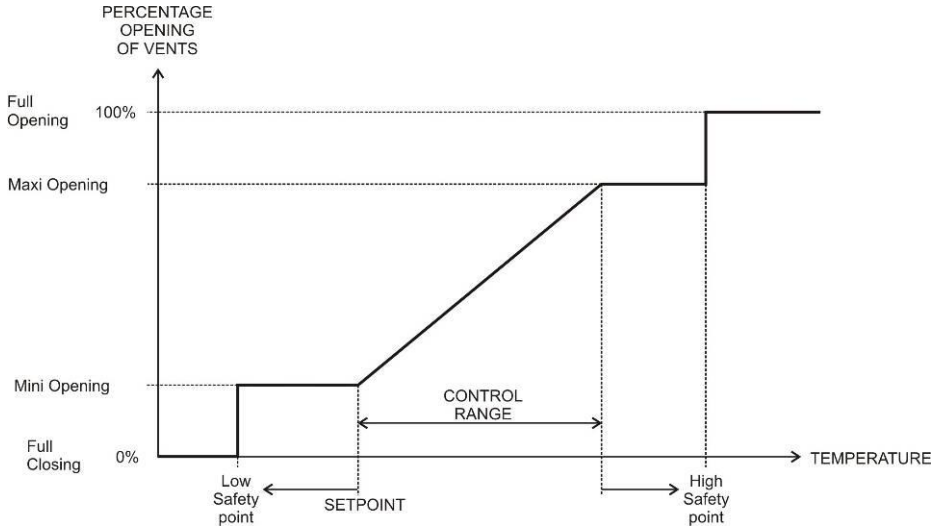
3.2. Vent operation

3.2.1. Principle

- **Basic principles**

The regulator controls the opening and closing of the vents so that they are positioned proportionally to the temperature between:

- *Minimum opening*, which corresponds to the opening when the temperature is equal to the setpoint value and
- *Maximum opening*, which corresponds to the opening when the temperature is equal to the value "setpoint + control range".



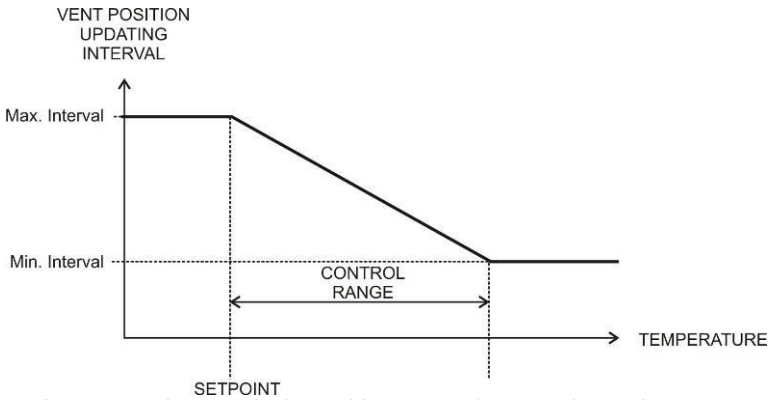
➔ with this system, the vents open wider as the temperature rises.

Two temperature safety points, one below and one above the setpoint, are used to trigger:

- complete closing (0%) when the temperature is very low or
- complete opening (100%) when the temperature is very high.

The vent position is computed at regular intervals. This interval may also change proportionally to the temperature between:

- a maximum interval, which is the interval used when the temperature is equal to the setpoint value and
- a minimum interval, which is the interval used when the temperature is equal to the value "setpoint + control range".



➔ with this system, the vents change their position more frequently as the temperature rises.

In addition, 3 operating modes are possible for the vents (with 2 sides):

1) Simultaneous operation: both sides open and close at the same time in relation to the main setpoint. In weather safety mode, both sides open to the defined "exposed side" opening position if necessary.

2) Operation in cascade (only possible with wind vane sensor connected): the side sheltered from the wind opens first after the main setpoint is reached, then the exposed side (facing the wind) opens after the main setpoint + a temperature offset is reached. During closing, the exposed side closes first, then the sheltered side. In weather safety mode, the opening position will depend on the wind direction and the setting of the "sheltered side" and "exposed side" opening positions.

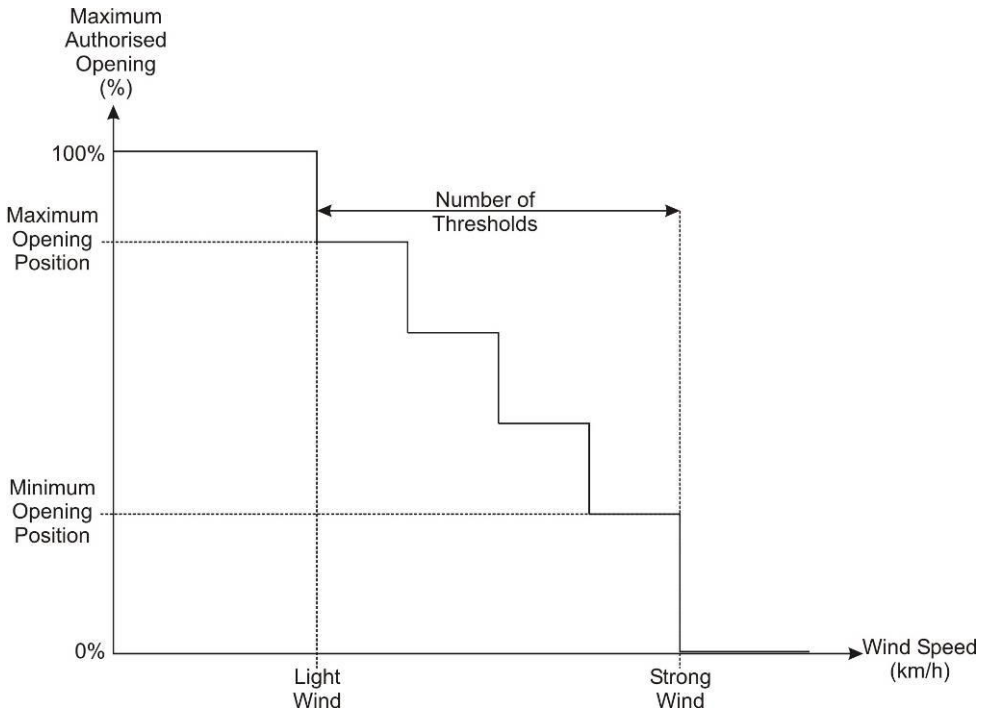
3) Operation with priority to one side (right or left): the side with priority opens first after the main setpoint is reached, then the other side opens after the main setpoint + a temperature offset is reached. In weather safety mode, the side with priority opens to the "exposed side" position.

If only one side is ventilated, the operating mode must be "simultaneous".

- **Weather safety functions:**

If there is a light wind or rain, the controller allows the vents to open up to a certain percentage.
If there is a strong wind, the vents are closed completely.

The "light wind" opening positions depend on the wind speed as shown in the following diagram:

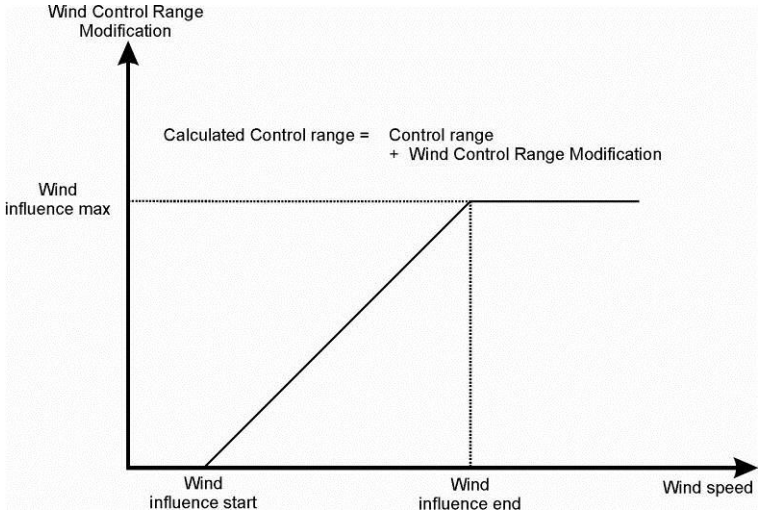


If there is a light wind ***and*** rain, the controller uses whichever is smaller, the "Wind" opening position or the "Rain" opening position.
Regardless of the reasons for opening (high temperature, dehumidifying, etc.), closing by the weather safety function always has priority.

- **Weather influences**

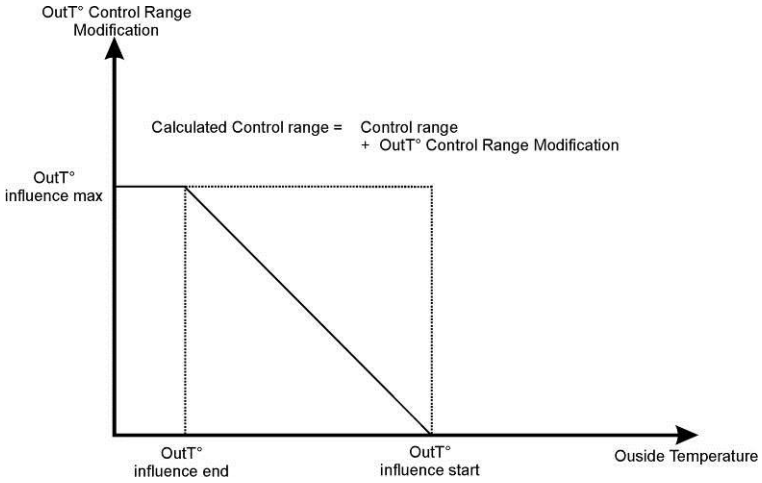
The wind

The influence of the wind on ventilations will be valid only for speeds below the light wind. The regulation with the stages winds remains valid beyond. The goal of wind influence is to increase the control range of a value proportional to the speed of wind. The more there is wind, the more the ventilations will be closed


Wind Control Range Modification
Calculated Control range = Control range + Wind Control Range Modification
Wind influence max
Wind influence start
Wind influence end
Wind speed

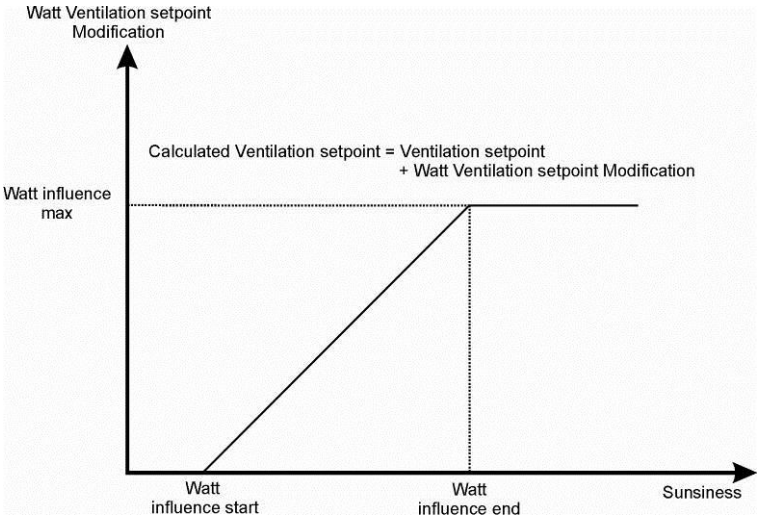
Outside temperature

The goal of outside temperature influence is to increase the control range of a value proportional to the outside temperature. The more the outside temperature is low, the more the ventilations will be closed


OutT° Control Range Modification
Calculated Control range = Control range + OutT° Control Range Modification
OutT° influence max
OutT° influence end
OutT° influence start
Ouside Temperature

Sunniness

The value of the sunniness to be taken into account is the average over the last hour. The influence acts directly on the ventilation setpoint by adding or by removing a value proportional to the average of sunniness of the last hour. The goal of the influence for example is to increase the setpoint of ventilation the summer in the case of strong sunniness in order to make work the plant more.


Watt Ventilation setpoint Modification
Calculated Ventilation setpoint = Ventilation setpoint + Watt Ventilation setpoint Modification
Watt influence max
Watt influence start
Watt influence end
Sunsiness

- **Influencing factors:**

Even if the temperature is below the setpoint, the vents may open in the following situations:

1. dehumidification (Interior humidity level too high)
2. thermal inversion (only during the night, when the outside temperature is greater than the inside temperature).

Likewise, if the temperature is above the setpoint, the vents may still close in the following situations:

1. fog injection
2. use of the cooling system
3. CO2 injection
4. imposed closing times.

3.2.2. Parameters

Notes :
- the symbol means that the menu opens after a long press
- in some cases parameters may be masked; see the corresponding notes at the end of the list of parameters

Setpoints Menu ➔ Ventilation

AA01	Ventil. Main Setp. X

Main setpoint of the vents
Temperature at which the controller begins to open the vents on the priority side

Min : ***-9.9 °C***
Max : ***99.9 °C***
Default : ***25.0 °C***

No interlock in relation to heating setpoints

Ventilation Menu ➔ Operation

CA01	Operating mode

Operating mode
Vent opening or closing mode (simultaneous, wind-dependent or priority side)

Min : ***LEFT***
Max : ***WIND VANE***
Default : ***SIMULTAN.***

SIMULTAN.	Both sides open and close at the same time after the main setpoint has been reached.
RIGHT	The right side opens first after the main setpoint is reached, then the left side opens after the main setpoint + a temperature offset is reached.
LEFT	The left side opens first after the main setpoint is reached, then the right side opens after the main setpoint + a temperature offset is reached.
WIND VANE	The side sheltered from the wind opens first after the main setpoint is reached, then the exposed side (facing the wind) opens after the main setpoint + a temperature offset is reached.

or

CA01	Operating mode

Operating mode (single slope vent)
Vent opening or closing mode

Min : ***SIMPLE***
Max : ***WIND VANE***
Default : ***SIMPLE***

SIMPLE	The vents open and close according to the ventilation setpoint.
WIND VANE	The vents open and close according to the ventilation setpoint by respecting sheltered and exposed sides indicated by the wind vane

CA02	Setp. Offset Exp.Side		(1)
Setpoint offset on exposed side		Min :	***0.0 °C***
Value added to the ventilation setpoint to provide the vent opening setpoint on the side without priority		Max :	***20.0 °C***
		Default :	***2.0 °C***

CA03	Control Range		
Ventilation control range		Min :	***1.0 °C***
Range situated above the ventilation setpoint in which the vents open proportionally to the temperature		Max :	***50.0 °C***
		Default :	***5.0 °C***

CA04	Night Variation		(2)
Night variation setpoint		Min :	***-10.0 °C***
Number of degrees removed or added to the ventilation setpoint during the night		Max :	***10.0 °C***
		Default :	***0.0 °C***

CA05	Forced Cl. Start Time		
Forced closing start time		Min :	***0h00***
Time when the controller begins to close the vents by the percentage set without taking the temperature into account (set to 24.00 to disable this function => display "No")		Max :	***23h59***
		Default :	***No (=24h00)***

CA06	Forced Cl. End Time		(3)
Forced closing end time		Min :	***0h00***
Time from which the controller begins to open and close the vents according to the temperature		Max :	***23h59***
		Default :	***No (=24h00)***

Ventilation Menu ➔ Vents

CB01	Rain Posit. Sh. Side		(1)
Rain opening position on sheltered side		Min :	***0 %***
Maximum authorized opening percentage of the vents on the side sheltered from the wind during rain		Max :	***100 %***
		Default :	***30 %***

CB02	Rain Posit. Exp Side		
Rain opening position on exposed side		Min :	***0 %***
Maximum authorized opening percentage of the vents on the side exposed to the wind during rain		Max :	***100 %***
		Default :	***30 %***

CB03	Wind Min.Pos Sh. Side		(1)
Light wind minimum opening position on sheltered side		Min :	***0 %***
Minimum authorized opening percentage of the vents on the side sheltered from light wind		Max :	***CB05***
		Default :	***30 %***

CB04	Wind Min.Pos Exp Side		
Light wind minimum opening position on exposed side		Min :	***0 %***
Minimum authorized opening percentage of the vents on the side exposed to a light wind		Max :	***CB06***
		Default :	***30 %***

CB05	**Wind Max.Pos Sh. Side**			(1)(4)
Light wind maximum opening position on sheltered side		Min :	***CB03***	
Maximum authorized opening percentage of the vents on the side sheltered from light wind		Max :	***100 %***	
		Default :	***30 %***	

CB06	**Wind Max.Pos Exp Side**			(4)
Light wind maximum opening position on exposed side		Min :	***CB04***	
Maximum authorized opening percentage of the vents on the side exposed to a light wind		Max :	***100 %***	
		Default :	***30 %***	

CB07	**Mini Opening Sh. Side**			(1)
Minimum opening of sheltered side vent		Min :	***0 %***	
Minimum opening imposed on sheltered side regardless of the weather conditions (except for strong wind)		Max :	***CB09***	
		Default :	***0 %***	

CB08	**Mini Opening Exp Side**			
Minimum opening of exposed side vent		Min :	***0 %***	
Minimum opening imposed on exposed side regardless of the weather conditions (except for strong wind)		Max :	***CB10***	
		Default :	***0 %***	

CB09	**Maxi Opening Sh. Side**			(1)
Maximum opening of sheltered side vent		Min :	***CB07***	
Maximum authorized opening percentage on sheltered side		Max :	***100 %***	
		Default :	***100 %***	

CB10	**Maxi Opening Exp Side**			
Maximum opening of exposed side vent		Min :	***CB08***	
Maximum authorized opening percentage on exposed side		Max :	***100 %***	
		Default :	***100 %***	

Ventilation Menu ➔ Influences

CC01	**Forced Op. Dehum. Sh.**			(1)(5)
Forced opening for dehumidification on sheltered side		Min :	***0 %***	
Percentage opening imposed on the sheltered side vent for dehumidification		Max :	***100 %***	
		Default :	***20 %***	

CC02	**Forced Op. Dehum. Exp**			(5)
Forced opening for dehumidification on exposed side		Min :	***0 %***	
Percentage opening imposed on the exposed side vent for dehumidification		Max :	***100 %***	
		Default :	***20 %***	

CC03	**Forced Cl. Fog Sh.**			(1)(6)
Forced closing for fogging on sheltered side		Min :	***0 %***	
Percentage closing imposed on sheltered side vent while the fogging system is operating		Max :	***100 %***	
		Default :	***0 %***	

CC04	Forced Cl. Fog Exp			(6)
Forced closing for fogging on exposed side		Min :	***0 %***	
Percentage closing imposed on exposed side vent while the fogging system is operating		Max :	***100 %***	
		Default :	***0 %***	

CC05	Forced Cl. Cool. Sh.			(1) (7)
Forced closing for cooling on sheltered side		Min :	***0 %***	
Percentage closing imposed on sheltered side vent while the cooling system is operating		Max :	***100 %***	
		Default :	***0 %***	

CC06	Forced Cl. Cool. Exp			(7)
Forced closing for cooling on exposed side		Min :	***0 %***	
Percentage closing imposed on exposed side vent while the cooling system is operating		Max :	***100 %***	
		Default :	***0 %***	

CC07	Forced Cl. CO2 Sh.			(1) (8)
Forced closing for CO2 on sheltered side		Min :	***0 %***	
Percentage closing imposed on sheltered side vent while the CO2 system is operating		Max :	***100 %***	
		Default :	***0 %***	

CC08	Forced Cl. CO2 Exp			(8)
Forced closing for CO2 on exposed side		Min :	***0 %***	
Percentage closing imposed on exposed side vent while the CO2 system is operating		Max :	***100 %***	
		Default :	***0 %***	

CC09	Therm. Inversion Setp			(9)
Thermal inversion setpoint		Min :	***0,5 °C***	
Difference between the inside and outside temperature which, if exceeded, triggers the controller to open the vents at night		Max :	***50.0 °C***	
		Default :	***No (= 50.0 °C)***	

CC10	Forced Op. T.Inv. Sh.			(1) (9)
Forced opening during thermal inversion on sheltered side		Min :	***0 %***	
Percentage opening imposed on the sheltered side vent during thermal inversion		Max :	***100 %***	
		Default :	***20 %***	

CC11	Forced Op. T.Inv. Exp			(9)
Forced opening during thermal inversion on exposed side		Min :	***0 %***	
Percentage opening imposed on the exposed side vent during thermal inversion		Max :	***100 %***	
		Default :	***20 %***	

CC12	Forced Cl. Time Sh.			(1) (3)
Forced closing at imposed times on sheltered side		Min :	***0 %***	
Percentage closing imposed on sheltered side vent from the indicated time		Max :	***100 %***	
		Default :	***0 %***	

CC13	Forced Cl. Time Exp			(3)
Forced closing at imposed times on exposed side		Min :	***0 %***	
Percentage closing imposed on exposed side vent from the indicated time		Max :	***100 %***	
		Default :	***0 %***	

Ventilation Menu ➔ Weather Influences (accessible only in "Expert" mode)

CD01	Wind influence start

Wind influence start
Value of the wind from which the regulator will modify the control range of ventilations

Min : ***0Km/h***
Max : ***CD02***
Default : ***10Km/h***

CD02	Wind influence end

Wind influence end
Maximum value of the wind taken into account for the modification of the control range of ventilations

Min : ***CD01***
Max : ***99Km/h***
Default : ***30Km/h***

CD03	Wind influence max

Wind influence maximum
Value added to the control range of ventilation when the value of the wind is equal to "Wind influence end"

Min : ***0.0°C***
Max : ***9.9°C***
Default : ***0.0°C***

CD04	OutT° influence start

(8)

Outside Temperature influence start
Value of the outside temperature from which the regulator will modify the control range of ventilations

Min : ***CD05***
Max : ***99.9°C***
Default : ***15.0°C***

CD05	OutT° influence end

(8)

Outside Temperature influence end
Maximum value of the outside temperature taken into account for the modification of the control range of ventilations

Min : ***-9.9°C***
Max : ***CD04***
Default : ***5.0°C***

CD06	OutT° influence max

(8)

Outside Temperature influence maximum
Value added to the control range of ventilation when the value of the outside temperature is equal to "OutT° influence end"

Min : ***0.0°C***
Max : ***9.9°C***
Default : ***0.0°C***

CD07	Watt influence start

(10)

Sunniness influence start
Value of the Sunniness from which the regulator will modify the ventilations setpoint

Min : ***0W/m²***
Max : ***CD08***
Default : ***200W/m²***

CD08	Watt influence end

(10)

Sunniness influence end
Maximum value of the Sunniness taken into account for the modification of the ventilations setpoint

Min : ***CD07***
Max : ***1500W/m²***
Default : ***500W/m²***

CD09	Watt influence max

(10)

Sunniness influence maximum
Value added to the ventilations setpoint when the value of the Sunniness is equal to "Watt influence end"

Min : ***-9.9°C***
Max : ***9.9°C***
Default : ***0.0°C***

Ventilation Menu ➔ Constructor

CX01	Movement Time

Movement time of vents
Time (in seconds) taken by the vents to move from fully close to fully open

Min : ***10 s***
Max : ***999 s***
Default : ***60 s***

CX02	Orientation

(11)

Orientation of ventilations
Orientation of the air vents in relation to the wind rose

Min : ***N***
Max : ***NE***
Default : ***N***

or

CX03	Orientation

(12)

Orientation of ventilations (Single slope vent)
Orientation of the air vents in relation to the 2D wind vane

Min : ***RIGTH***
Max : ***LEFT***
Default : ***RIGTH***

CX04	Safety Repositioning

Safety repositioning
Used to force reset of the vents before setting the opening for rain or light wind

Min : ***No***
Max : ***Yes***
Default : ***No***

CX05	1st Reposition. Time

First repositioning time
Used to trigger automatic reset of the vents at the indicated time

Min : ***0h00***
Max : ***24h00 (= No)***
Default : ***8h00***

CX06	2nd Reposition. Time

Second repositioning time
Used to trigger automatic reset of the vents at the indicated time

Min : ***0h00***
Max : ***24h00 (= No)***
Default : ***20h00***

CX07	Low Safety

Low safety threshold
Safety temperature setting below the setpoint at which the vents close completely (without taking minimum into account)

Min : ***-1.0°C***
Max : ***-50.0°C***
Default : ***- 5°C***

CX08	High safety

High safety threshold
Safety temperature setting above the setpoint + control range at which the vents open completely (without taking the maximum into account)

Min : ***1.0°C***
Max : ***50.0°C***
Default : ***10°C***

CX09	Mini Pulse Interval

Minimum pulses interval
Minimum time interval between two successive calculations of the vent positions

Min : ***0s***
Max : ***CX09 – 5***
Default : ***30s***

CX10	Maxi Pulse Interval

Maximum pulses interval
Maximum time interval between two successive calculations of the vent positions

Min : ***CX08 + 5***
Max : ***999s***
Default : ***200s***

CX11	Minimum Movement

Minimum movement as percentage
Minimum opening or closing percentage applied by the controller for each positioning pulse

Min : ***1%***
Max : ***50%***
Default : ***5%***

CX12	Thermal Invers. Diff.	(9)

Thermal inversion differential
Value which, added to the thermal inversion setpoint, provides the inversion stop setpoint.

Min : ***0.5°C***
Max : ***50.0°C***
Default : ***5°C***

Notes : Parameter visible:

(1) For double-slope vents, set to "left side priority", "right side priority" or "wind vane" operating mode

(2) If the "Period" option is not used

(3) If "CA05" and "CA06" are other than NO.

(4) If the number of wind thresholds (BA03) is greater than 1

(5) If the "Fog" option is used

(6) If the "Cooling" option is used

(7) If the "CO2 injection" option is used

(8) If the outside temperature sensor is connected

(9) If the outside temperature sensor is connected and "CC09" is other than 50.0°C

(10) If the sunniness sensor is connected

(11) For double-slope vents only and if the 0/360° wind vane sensor is connected

(12) For single-slope vents only and if the 0/360° wind vane sensor is not connected

3.2.3. Reading screens

Reading Menu ➔ Ventilation (next : ⊖ or ⊕ to change screen)

Screen 1/4 :

for double side ventilation

1.	+xx.x°C	Left	Right
2.	Status>	xxxxxx	xxxxxx
3.	Setp. >	+xx.x°	+xx.x
4.	Mini >	xxx%	xxx%
5.	Pos. >	xxx%	xxx%
6.	Maxi >	xxx%	xxx%

or

for single side ventilation

Air Temp°	>+xx.x°C
Status	> xxxxxx
Setpoint	> +xx.x°
Minimum Open.	> xxx%
Position	> xxx%
Maximum Open.	> xxx%

1. Measured ambient temperature and priority side in reverse video
2. Ventilation status : Manual, Repositioning, Immobile, Opening or Closing
3. Calculated setpoint for each side
4. Calculated minimum opening for each side
5. Calculated actual position for each side
6. Calculated maximum opening for each side

Screen 2/4 :

1.	Weather	
2.	D/N Period	> D.
3.	Strong Wind	> xx
4.	Light Wind	> xx
5.	Rain	> xx
6.	Dehumidification	> xx

1.
2. Daytime period (day/night or active period number)
3. Strong wind detected ? (━ : no / ✔ : yes)
4. Light wind detected ? (━ : no / ✔ : yes)
5. Rain detected ? (━ : no / ✔ : yes)
6. Dehumidification in process ? (━ : no / ✔ : yes)

Screen 3/4 :

1.	Influences Weather	
2.	Wind	xxxKm/h>+x.x°C
3.	Ext.T°	+xx.x°C>+x.x°C
4.	Sun.	xxxxW/m²>+x.x°C
5.	Princ. Setp.	> xx.x°C
6.	Regul. Range	> xx.x°C

1.
2. Wind influence on principal setpoint
3. External temperature influence on principal setpoint
4. Sunniness influence on principal setpoint
5. Calculated principal setpoint
6. Calculated regulation range

Screen 4/4 :

1.	Influences
2.	Time Closing > xx
3.	Therm. Inversion > xx
4.	Cooling > xx
5.	Fog > xx
6.	CO2 Injection > xx

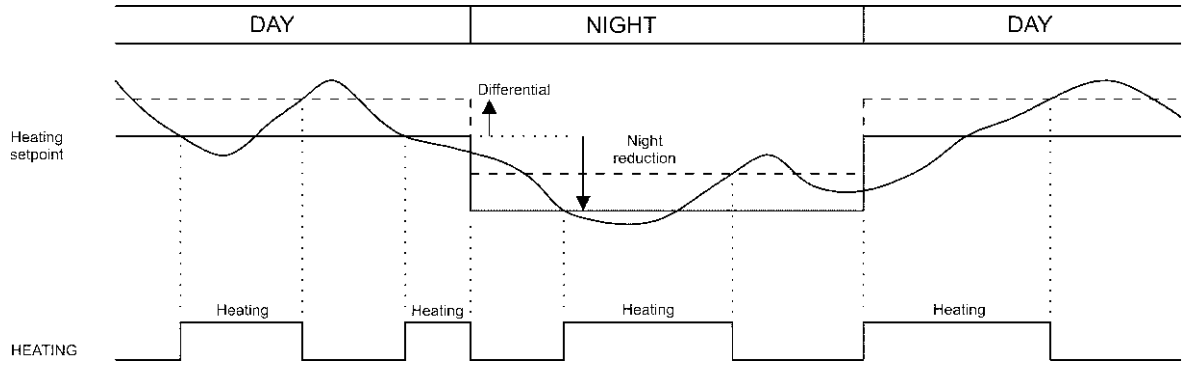
1.
2. Time closing active ? (━ : no / ✔ : yes)
3. Thermal inversion active ? (━ : no / ✔ : yes)
4. Cooling active ? (━ : no / ✔ : yes)
5. Fog active ? (━ : no / ✔ : yes)
6. CO^2 injection active ? (━ : no / ✔ : yes)

3.3. Thermostatic heating operation

3.3.1. Principle

The heating operates in ON/OFF mode, with a programmable differential.
Automatic setpoint lowering can be selected for during the night.
The setpoint can be automatically increased for dehumidification.

The graph below shows the operation of the thermostatic heating:

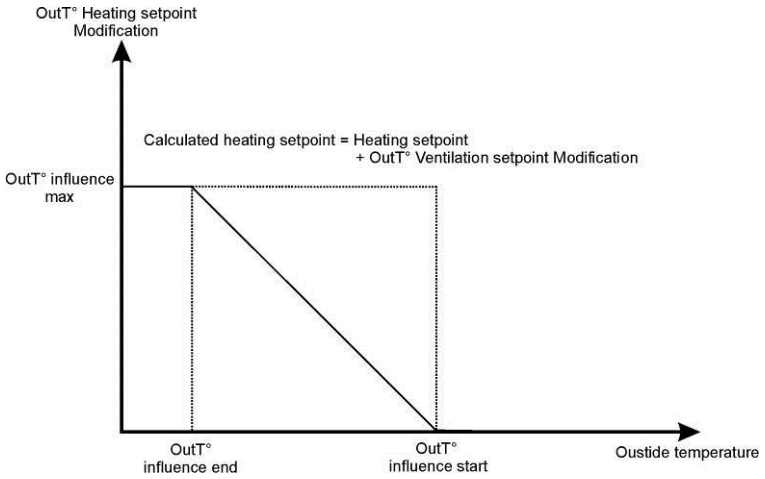


If a luxmeter is connected, the day and night start times cannot be set ➔ the controller changes the operating mode automatically (DAY/NIGHT) according to the light intensity (Lux).

- **Weather influences**

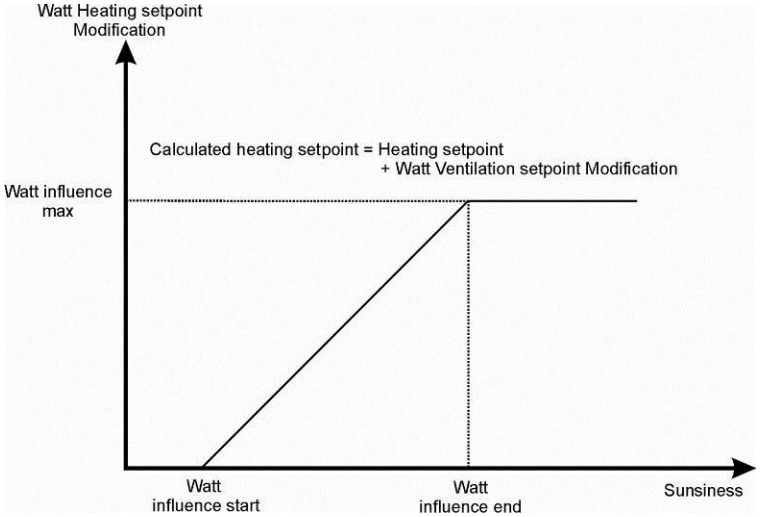
Outside temperature

The goal of outside temperature influence is to increase the heating setpoint of a value proportional to the outside temperature. The more the outside temperature is low, the more the heating setpoint will be high.


OutT° Heating setpoint Modification
Calculated heating setpoint = Heating setpoint + OutT° Ventilation setpoint Modification
OutT° influence max
OutT° influence end
OutT° influence start
Oustide temperature

Sunniness

The value of the sunniness to be taken into account is the average over the last hour. The influence acts directly on the heating setpoint by adding or by removing a value proportional to the average of sunniness of the last hour. The goal of the influence for example is to decrease the setpoint of heating in the case of strong sunniness and anticipate the greenhouse effect.


Watt Heating setpoint Modification
Calculated heating setpoint = Heating setpoint + Watt Ventilation setpoint Modification
Watt influence max
Watt influence start
Watt influence end
Sunsiness

3.3.2. Parameters

Notes :

- the symbol means that the menu opens after a long press
- in some cases parameters may be masked; see the corresponding notes at the end of the list of parameters

Setpoint Menu ➔ Ther. Heating

AB01	Ther.Heating Setpoint

Thermostatic heating setpoint

Air temperature below which the controller switches on the thermostatic heating

Min : ***-9.9 °C***
Max : ***99.9 °C***
Default : ***19.0 °C***

No Interlock in relation to ventilation setpoints

Thermostatic Heating Menu ➔ Operation

DA01	Differential

Heating thermostat differential
Value added to the air heating setpoint to provide the heating

Min : ***0.5 °C***
Max : ***10.0 °C***
Default : ***1.0 °C***

DA02	Night Variation

(1)

Setpoint variation during the night
Number of degrees removed or added to the heating setpoint during the night

Min : ***-10.0 °C***
Max : ***10.0 °C***
Default : ***0.0 °C***

DA03	Air Mixer Interlock

(2)

Air mixer interlock
Used to start up the air mixer when the heating is operating

Min : ***Yes***
Max : ***No***
Default : ***No***

Thermostatic Heating Menu ➔ Weather influences (accessible only in "Expert" mode)

DB01	OutT° influence start

(3)

Outside Temperature influence start
Value of the outside temperature from which the regulator will modify the heating setpoint

Min.: ***DB02***
Max.: ***99.9°C***
Default: ***15.0°C***

DB02	OutT° influence end

(3)

Outside Temperature influence end
Maximum value of the outside temperature taken into account for the modification of the heating setpoint

Min.: ***-9.9°C***
Max.: ***DB01***
Default: ***5.0°C***

DB03	OutT° influence max

(3)

Outside Temperature influence maximum
Value added to the heating setpoint when the value of the outside temperature is equal to "OutT° influence end"

Min.: ***0.0°C***
Max.: ***9.9°C***
Default: ***0.0°C***

DB04	Watt influence start

(4)

Sunniness influence start
Value of the Sunniness from which the regulator will modify the heating setpoint

Min.: ***0W/m²***
Max.: ***DB05***
Default: ***200W/m²***

DB05	Watt influence end

(4)

Sunniness influence end
Maximum value of the Sunniness taken into account for the modification of the heating setpoint

Min.: ***DB04***
Max.: ***1500W/m²***
Default: ***500W/m²***

DB06	Watt influence max

(4)

Sunniness influence maximum
Value added to the heating setpoint when the value of the Sunniness

-9.9°C
9.9°C

is equal to "Watt influence end" Default: ***0.0°C***

Notes : Parameter visible

(1) If the "Period" option is not used

(2) If the "Air Mixer" option is present

(3) If the outside temperature sensor is connected

(4) If the sunniness sensor is connected

3.3.3. Reading screens

Reading Menu ➔ Ther. Heating (next : ⅞ or ⅛ to change screen)

Screen 1/3 :

1.	Air Temp° > +xx.x°C
2.	Status > xxxxxxx
3.	
4.	Running T° > +xx.x°C
5.	Stopping T° > +xx.x°C

1. Measured ambient temperature
2. Thermostatic heating status : Run or Stop
3.
4. Calculated running setpoint
5. Calculated stop setpoint

Screen 2/3 :

1.	Influences Weather
2.	Ext.T° +xx.x°C>+x.x°C
3.	Sun. xxxxW/m²>+x.x°C
4.	Setpoint > xx.x°C

1.
2. External temperature influence on setpoint
3. Sunniness influence on setpoint
4. Calculated setpoint

Screen 3/3 :

```
1.  Influences
2.  D/N Period       > D.
3.  Dehumidification > xx
```

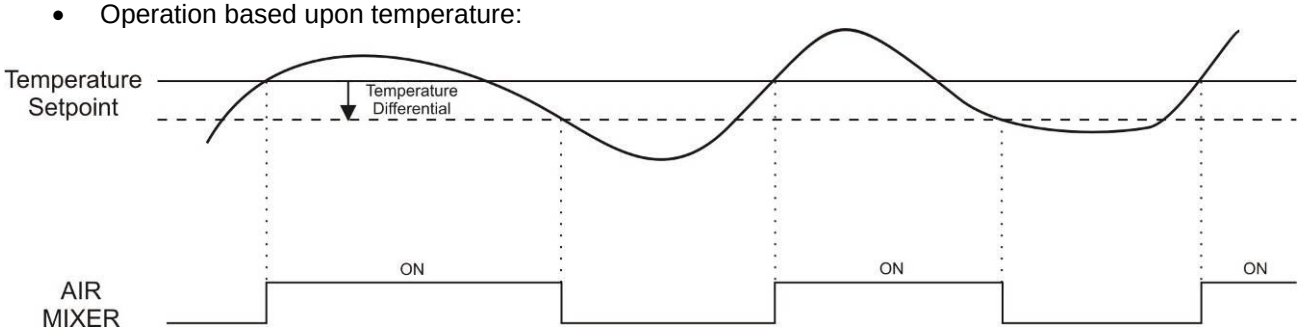
1.
2. Daytime period (day/night or active period number)
3. Dehumidification in process ? (━ : no / ✔ : yes)

3.4. Air mixer operation

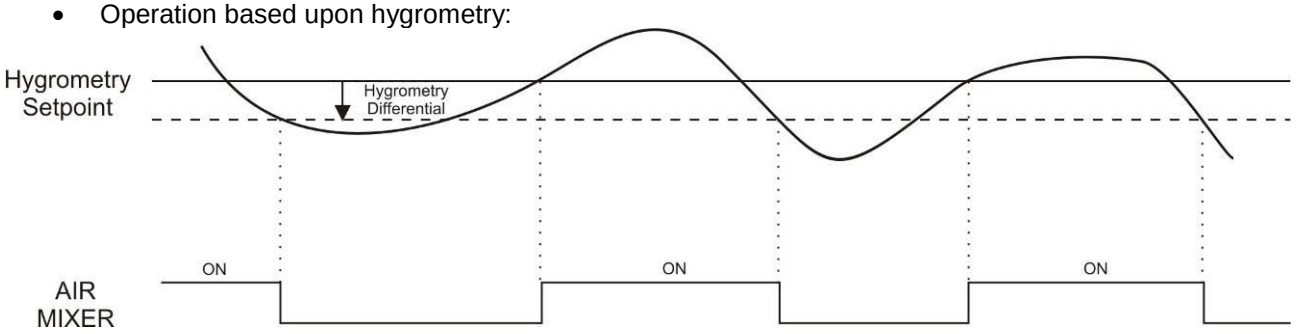
3.4.1. Principle

The Air mixer operates based upon two criteria, "on-or-off," with adjustable differentials.

- Operation based upon temperature:



- Operation based upon hygrometry:



In addition, the Air mixer can be controlled when:

- The thermostatic heating is operating.
- The "three-way valve" heating is operating (open).

(see "Air mixer interlock" parameters in the heating operation principle)

3.4.2. Parameters

Notes :
- the symbol 🌡 means that the menu opens after a long press
- in some cases parameters may be masked; see the corresponding notes at the end of the list of parameters

Setpoints Menu ➔ Air mixer

AF01	Temperature Setpoint

Temperature air mixer setpoint
Air temperature above which the controller activates the Air mixer

Min: ***-9.9°C***
Max: ***99.9°C***
Default: ***30°C***

AF02	Hygrometry Setpt.

Hygrometry air mixer setpoint
Air hygrometry above which the controller activates the Air mixer

Min: ***0%***
Max: ***100%***
Default: ***80%***

Air mixer Menu ➔ Operation

JA01	Temp. Differential

Temperature differential
Value which, added to the Air mixer temperature setpoint, provides the Air mixer stop setpoint

Min: ***0.5°C***
Max: ***10.0°C***
Default: ***1°C***

JA02	Hygro. Differential

Hygrometry differential
Value which, added to the Air mixer hygrometry setpoint, provides the Air mixer stop setpoint

Min: ***2%***
Max: ***20%***
Default: ***10%***

3.4.3. Reading screens

Reading Menu ➔ Air mixer (next : ⊘ or ⊘ to change screen)

Screen 1/2 :

1.	Air Temp° > +xx.x°C
2.	Temp° Setp. > +xx.x°C
3.	Hygrometry > xxx%
4.	Hygro Setp. > xxx%
5.	
6.	Status > xxxxxxx

1. Measured ambient temperature
2. Calculated running setpoint for temperature
3. Measured ambient hygrometry
4. Calculated running setpoint for hygrometry
5.
6. Air mixer status : Run or Stop

Screen 2/2 :

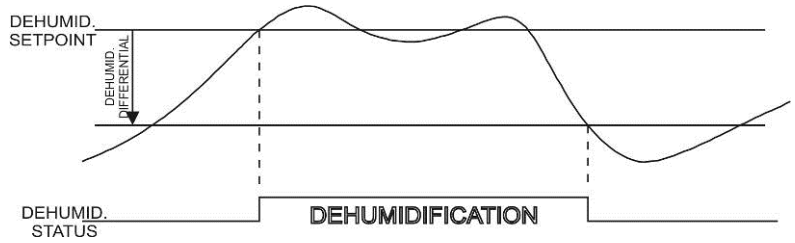
1.	Influences
2.	Ther. Heating > xx
3.	3WV Heating > xx
4.	Active Period > xx

1.
2. Thermostatic heating in use ? (━ : no / ✔ : yes)
3. 3WV heating in use ? (━ : no / ✔ : yes)
4. Active period number

3.5. Dehumidification operation

3.5.1. Principle

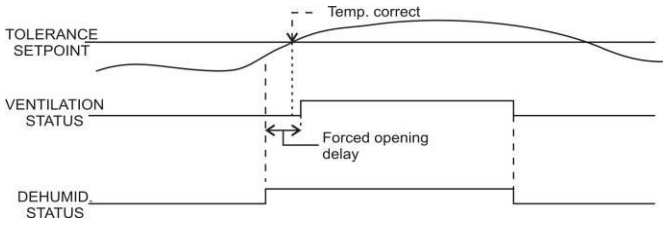
The controller can monitor dehumidification automatically if a humidity sensor is connected or. When dehumidification starts, the ventilation and heating setpoints are increased for a programmable time before partial opening of the vents. If the humidity level increases (rather than decreases) during a dehumidification cycle, the cycle is aborted: the controller attempts a new dehumidification cycle after a programmable time.
The graphs below show operation during dehumidification:



Several cases are possible:

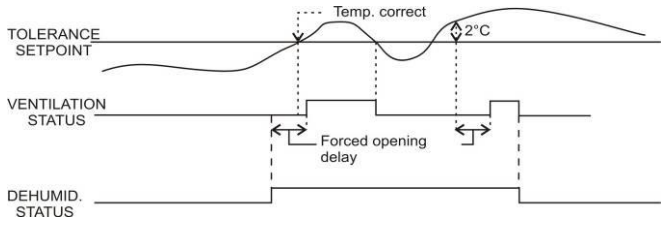
Case A :
When dehumidification begins, the temperature is greater than the tolerance value ➔ normal operation

During dehumidification, the temperature remains correct ➔ normal operation



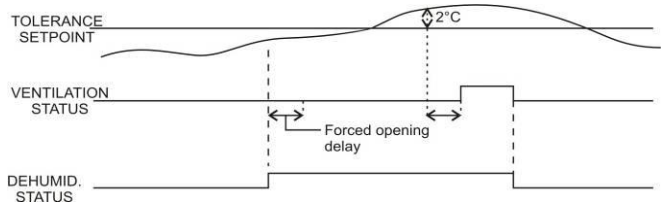
Case B :
When dehumidification begins, the temperature is greater than the tolerance value ➔ normal operation

During dehumidification the temperature drops below the tolerance threshold ➔ forced opening stops until the temperature returns to the setpoint plus 2°C



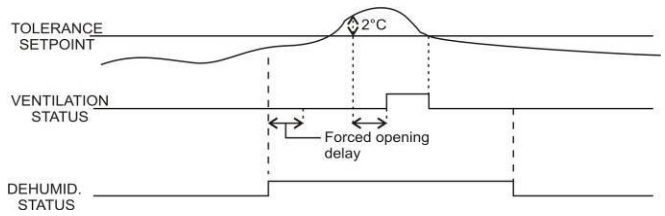
Case C :
When dehumidification starts, the tolerance setpoint is not reached before forced opening of the vent ➔ wait until setpoint is exceeded by 2°C

During dehumidification, the temperature remains correct ➔ normal operation



Case D :
When dehumidification starts, the tolerance setpoint is not reached before forced opening of the vent ➔ wait until setpoint is exceeded by 2°C

During dehumidification the temperature drops below the tolerance threshold ➔ forced opening stops until the temperature returns to the setpoint plus 2°C



SIMPLIFIED DESCRIPTION OF DEHUMIDIFICATION

Dehumidification with humidity sensor
When the "Dehumidification setpoint" is exceeded, the controller automatically runs the following operations:

1. Increase of "Heating setpoint" ⇒ the greenhouse becomes too warm
2. Time-delay during "Forced opening delay for dehumidification"
3. Vents opened to "Forced vent opening for dehumidification" ⇒ the humidity escapes through the vents.
4. Dehumidification stops if the humidity level returns below the "Dehumidification setpoint" less the "Dehumidification differential"

Various safety features are available to monitor dehumidification

1. Enabling or disabling dehumidification during the night ("Night-time dehumidification")
2. Enabling or disabling dehumidification during rain or slight wind ("Dehumidification during rain or slight wind")
3. Stopping dehumidification and closing the vents if the temperature in the greenhouse drops too much ("Temperature tolerance during dehumidification").
4. Stopping dehumidification if the humidity level increases to a given value ("Maximum overrun during dehumidification") for a given time "Overrun duration during dehumidification").
5. Minimum time between 2 dehumidification cycles ("Interval between two dehumidification cycles") after cancelling a cycle.

3.5.2. Parameters

Notes :
- the symbol means that the menu opens after a long press
- in some cases parameters may be masked; see the corresponding notes at the end of the list of parameters

Setpoints Menu ➔ Dehumidification

AE01	Dehumidification Setp

Dehumidification setpoint
Humidity level above which the controller begins the dehumidification cycle

Min : ***0 %***
Max : ***100 %***
Default : ***no (= 101 %)***

Dehumidification Menu ➔ Operation

HA01	Setpoints Increase

Value of setpoints increase
Value increasing the ventilation and heating setpoints for dehumidification

Min : ***0.0 °C***
Max : ***5.0 °C***
Default : ***2.0 °C***

HA02	Differential

Dehumidification differential
Value which, subtracted from the dehumidification setpoint provides the dehumidification stop setpoint

Min : ***2 %***
Max : ***20 %***
Default : ***10 %***

HA03	Night Dehumidificat.

Night-time dehumidification
Enables dehumidification between the start of night time and the start of day time

Min : ***Yes***
Max : ***No***
Default : ***No***

HA04	Rain Dehumidificat.

Dehumidification if there is rain
Enables dehumidification during rain

Min : ***Yes***
Max : ***No***
Default : ***No***

HA05	Temperature Tolerance

Temperature tolerance during dehumidification
Value below which the controller stops the dehumidification cycle

Min : ***-9.9 °C***
Max : ***99.9 °C***
Default : ***15.0 °C***

HA06	Temp. tolerance diff.

Temperature tolerance differential
Value which, added with the tolerance temperature provides the instruction of stop of security temperature in dehumidification

Min : ***0.0 °C***
Max : ***10.0 °C***
Default : ***2 °C***

HA07	Opening Delay

Forced opening delay during dehumidification
Time between the start of dehumidification and forced opening of vents for dehumidification

Min : ***0 min***
Max : ***99 min***
Default : ***15 min***

HA08	Maximum Overrun

Maximum overrun during dehumidification
Maximum humidity overrun value during a dehumidification cycle to cancel the cycle

Min : ***0 %***
Max : ***20 %***
Default : ***20 %***

HA09	Overrun Duration

Overrun duration during dehumidification
Time during which the humidity level can exceed the dehumidification setpoint before current cycle is cancelled

Min : ***1 min***
Max : ***99 min***
Default : ***99 min***

HA10	Interv. between Cycle

Interval between two dehumidification cycles
Waiting time before a new dehumidification cycle if the previous cycle is cancelled

Min : ***0h10***
Max : ***9h50***
Default : ***9h50***

HA11	Forc.Dehum Start Time

Time at which forced dehumidification starts
Time from which a forced dehumidification cycle must start regardless of the humidity level

Min : ***0h00***
Max : ***23h59***
Default : ***No (= 24h00)***

HA12	Forc.Dehum End Time

Time at which forced dehumidification stops
Time at which a forced dehumidification cycle must stop

Min : ***0h00***
Max : ***23h59***
Default : ***No (= 24h00)***

HA13	Authoriz. Start Time

Authorization start time
Time at which the dehumidification is authorized in automatic mode (in relation with the hygrometry sensor)

Min : ***0h00***
Max : ***23h59***
Default : ***0h00***

HA14	Authoriz. End Time

Authorization end time
Time at which the dehumidification is no longer authorized in automatic mode (in relation with the hygrometry sensor)

Min : ***0h00***
Max : ***23h59***
Default : ***23h59***

3.5.3. Reading screens

Reading Menu ➔ Dehumid. (next : ⊖ or ⊕ to change screen)

Screen 1/2 :

1.	Hygrometry > xxx%
2.	Setpoint > xxx%
3.	Air Temp° > +xx.x°C
4.	
5.	Status > xxxxxxxxxx
6.	Tempo > xx:xx

1. Measured ambient hygrometry (--- % if not detected at start-up)
2. Calculated dehumidification setpoint
3. Measured ambient temperature
4.
5. Dehumidification status : Inactive, Opening Delay, Opening ventilation, Security Temperature, Exceeding, Cycle Gap
6. Temporization in process (before opening, when exceeding, …)

Screen 2/2 :

1.	Influences
2.	D/N Period > D.
3.	Time Segment > xx
4.	Rain > xx
5.	Active Period > xx

1.
2. Daytime period (day/night)
3. Dehumidification according to time period active ? (━ : no / ✔ : yes)
4. Rain detected ? (━ : no / ✔ : yes)
5. Active period number

3.6. Shade curtain operation

3.6.1. Principle

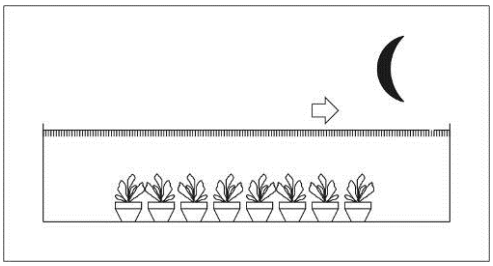
- **Basic principles**

The controller can control a shade (or thermal) screen according to the incident solar power (W/m²).

Operation as thermal screen (at night)

The evening closing time (nightfall) and morning opening time (daybreak) can be programmed according to the season so that the plants gain maximum benefit from the length of the daylight.

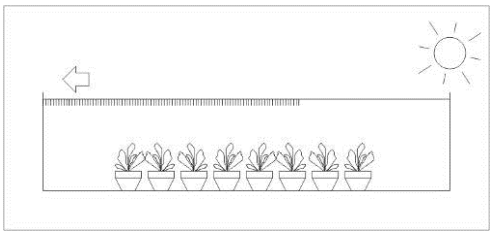
Example 1 : During the night, the curtain is closed as a thermal screen to reduce the heating requirement. It is possible to leave a night opening position. Night is defined by programming 2 times or detected automatically by the Lux sensor.



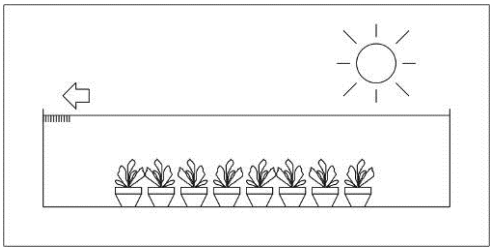
Operation as shade curtain (day time)

Excessive solar power on the plants may burn them. The curtain closes when the value measured on the Watt sensor exceeds the programmed threshold.

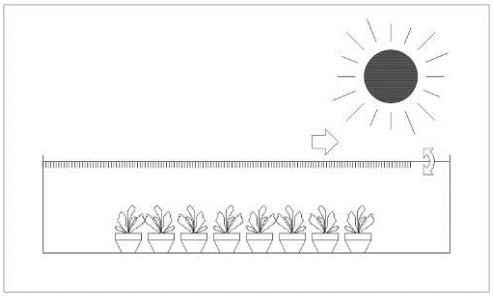
Example 2 : The morning cycle begins at the daybreak setting; the controller starts by setting an opening for a few minutes. Then the screen is opened gradually by pulses and intervals. Once it reaches a given opening percentage, it completes the opening operation in a single stroke.



Example 3 : During the day, with normal sunlight, (below the solar power setpoint), the curtain is opened to maximum position (100 %).



Example 4 : During the day, with dangerous sunlight, (above the solar power setpoint), the curtain is closed to the daytime opening position.



If a luxmeter is connected, the day and night start times cannot be modified ➔ the controller changes the operating mode (shade or thermal screen) automatically according to the light intensity (Lux).

- **Influencing factors:**

Ambient temperature (inside)
Temperature, like solar power, may be a factor influencing the opening and closing of the shade curtain:
- Closing in case of too high temperature (Thermal high) or too low (Thermal low);
- Reopening when the temperature goes down again (Thermal high) or goes up (Thermal low)

Ambient humidity (inside)
For dehumidification, if the curtain is closed by the position setting, it is possible to add an extra opening to allow greater exchange of air between the ground and the roof so that the humidity can escape more easily.

3.6.2. Parameters

Notes :
- the symbol 🔒 means that the menu opens after a long press
- in some cases parameters may be masked; see the corresponding notes at the end of the list of parameters

Setpoint menu ➔ Shade

AD01	Sunniness Setpoint		
Shade setpoint based on solar power (Watt/m²) Measured Watt value above which the controller triggers closing during the day		Min : Max : Default :	***0 W/m²*** ***999 W/m²*** ***300 W/m²***

AD02	Thermal high Stpt		(1)
Thermal high setpoint Measured inside temperature above which the controller triggers closing during the day		Min : Max : Default :	***AD03*** ***99.9 °C*** ***No (= 100 °C)***

AD03	Thermal low Stpt		(1)
Thermal low setpoint Measured inside temperature below which the controller triggers closing during the day		Min : Max : Default :	***AD02*** ***99.9 °C*** ***Non (=-10.0 °C)***

Shade menu ➔ Operation

FA01	Shade/Th.Screen Mode

"Shade screen" or "thermal screen" mode
Choice of operating mode for switching from "shade screen" to "thermal screen".

HOUR	based on programmed times
LUX	based on Lux sensor reading
CALC.	Based on Sunrise and sunset hour calculated by the regulator

Min : ***HOUR***
Max : ***CALC.***
Default : ***CALC.***

FA02	Shade Start Time

(2)

Start time for operation in "shade screen" mode
Time from which the controller must operate in shade screen mode if the Shade/Screen mode is set to "Manual" or if there is no lux sensor connected

Min : ***0.00***
Max : ***FA03***
Default : ***8.00***

FA03	Th. Screen Start Time

(2)

Start time for operation in "thermal screen" mode
Time from which the controller must operate in thermal screen mode if the Shade/Screen mode is set to "Manual" or if there is no lux sensor connected

Min : ***FA02***
Max : ***23.59***
Default : ***20.00***

FA04	Shade var. Sunrise T

(3)

Variation compared to the hour of Sunrise for "shade screen" mode
Variation compared to the Sunrise hour giving the hour as from which the regulator must function in "Shade screen" if the "Shade/Th.Screen Mode" is set on " Calc. "

Min : ***-180mn***
Max : ***+180mn***
Défaut : ***0mn***

FA05	Th.Scr. var. Sunset T

(3)

Variation compared to the hour of Sunset for "Thermal screen" mode
Variation compared to the Sunset hour giving the hour as from which the regulator must function in "Thermal screen" if the "Shade/Th.Screen Mode" is set on " Calc."

Min : ***-180mn***
Max : ***+180mn***
Défaut : ***0mn***

FA06	Morning Op. Hold Time

Morning opening hold time
Time during which the controller maintains the morning opening position before switching to the day time setting

Min : ***0 min***
Max : ***99 min***
Default : ***5 min***

FA07	Morning Opening Pulse

Morning opening pulse
Duration of screen opening pulses in the morning (as percentage of movement duration)

Min : ***1 %***
Max : ***99 %***
Default : ***5 %***

FA08	Morning Opening Inter

Interval between morning opening pulses
Time between two successive opening pulses in the morning

Min : ***0 s***
Max : ***99 s***
Default : ***5 s***

FA09	Morning Control Zone

Morning regulation range
Percentage of opening during which the controller opens the screen in successive pulses in the morning before moving to full opening

Min : ***0 %***
Max : ***100 %***
Default : ***75 %***

Shade menu ➔ Opening positions

FB01	Day Opening Vent

Day-time opening for sunlight
Percentage of opening that the controller must leave during the day regardless of the day-time period

Min : ***0 %***
Max : ***100 %***
Default : ***10 %***

FB02	Night Opening Vent

Night-time thermal screen opening
Percentage of opening that the controller must leave during night-time

Min : ***0 %***
Max : ***100 %***
Default : ***0 %***

FB03	Morning Opening Vent

Morning thermal screen opening
Percentage of opening that the controller must leave in the morning during the switch from "thermal screen" to "shade screen" mode

Min : ***0 %***
Max : ***100 %***
Default : ***10 %***

FB04	Thermal high Vent	(4)

Thermal high day-time opening for temperature
Percentage of opening that the controller must leave during the day when the temperature is above the thermal high setpoint

Min : ***0 %***
Max : ***100 %***
Default : ***10 %***

FB05	Thermal low Vent	(5)

Thermal low day-time opening for temperature
Percentage of opening that the controller must leave during the day when the temperature is below the thermal low setpoint

Min : ***0 %***
Max : ***100 %***
Default : ***0 %***

Shade menu ➔ Influencing factors

FC01	Dehumid. Opening Vent	(6)

Additional opening for dehumidification

Percentage of opening added to the day-time opening for dehumidification

Min : ***0 %***
Max : ***100 %***
Default : ***5 %***

FC02	Morn. Op. Forced Temp	(1)

Temperature forcing a hold of morning opening

Temperature below which the controller must hold the morning opening and disable gradual opening

Min : ***-9.9 °C***
Max : ***99.9 °C***
Default : ***No (= -10 °C)***

FC03	Morn. Op. Cancel Temp	(1)

Morning opening cancellation temperature

Temperature above which the controller cancels gradual opening and opens in a single stroke

Min : ***-9.9 °C***
Max : ***99.9 °C***
Default : ***No (= 100 °C)***

Shade menu ➔ Weather Influences (accessible only in "Expert" mode)

FD01	OutT° influence start	(7)

Outside Temperature influence start

Value of the outside temperature from which the regulator will modify the thermal low setpoint

Min : ***99.9°C***
Max : ***FD02***
Défaut : ***15.0°C***

FD02	OutT° influence end	(7)

Outside Temperature influence end

Maximum value of the outside temperature taken into account for the modification of the thermal low setpoint

Min : ***-9.9°C***
Max : ***FD01***
Défaut : ***5.0°C***

FD03	OutT° influence max	(7)

Outside Temperature influence maximum

Value added to the thermal low setpoint when the value of the outside temperature is equal to "OutT° influence end"

Min : ***0.0°C***
Max : ***9.9°C***
Défaut : ***0.0°C***

Shade menu ➔ Constructor

FX01	Movement Time

Screen movement time
Time (in seconds) taken by the shade screen to move from fully closed to fully open

Min : ***10 s***
Max : ***999 s***
Default : ***60 s***

FX02	Sunniness Different.

Watt differential triggering screen reopening
The value which, when subtracted from the Watts threshold, provides the threshold that triggers reopening during the day

Min : ***10 W/m²***
Max : ***999 W/m²***
Default : ***50 W/m²***

FX03	Temperature Differ.

(4)(5)

Temperature differential triggering screen reopening
The value which, when subtracted from the temperature threshold, provides the threshold that triggers reopening during the day

Min : ***0.5 °C***
Max : ***10.0 °C***
Default : ***1.0 °C***

FX04	Day Closing Tempo.

Temporization for day closing
Time during which the Watts or temperature must be greater or lower than the set thresholds before the controller closes the shade screen

Min : ***0 min***
Max : ***30 min***
Default : ***1 min***

FX05	Day opening Tempo.

Temporization for day opening
Time during which the Watts or temperature must be greater or lower than the set thresholds before the controller opens the shade screen

Min : ***0 min***
Max : ***30 min***
Default : ***4 min***

Notes : Parameter visible:

(1) If the inside temperature sensor is connected

(2) If FA01 is set to "Manual"

(3) If FA01 is set to "Calc." and only for "expert" operation mode

(4) If the inside temperature sensor is connected and AD02 is less than 100.0°C

(5) If the inside temperature sensor is connected and AD03 is more than -10.0°C

(6) If the "Dehumidification" option is used

(7) If the outside temperature sensor is connected

3.6.3. Reading screens

Reading Menu ➔ shade (next : ⊖ or ⊕ to change screen)

Screen 1/2 :

1.	Sunniness >xxxxW/m²
2.	Watt Setp. >xxxxW/m²
3.	Air Temp° > +xx.x°C
4.	Temp° Setp. > +xx.x°C
5.	Status > xxxxxxx
6.	Position > xxx%

1. Measured sunniness (----W/m² if not detected at start-up)
2. Sunniness setpoint
3. Measured ambient temperature
4. Ambient temperature setpoint
5. Shade status : Manual, Repositioning, Immobile, Opening or Closing
6. Calculated actual position of valve

Screen 2/3 :

1.	Influences Weather
2.	Ext.T° +xx.x°C>+x.x°C
3.	L.Therm.Setp > xx.x°C

1.
2. External temperature influence on thermal low setpoint
3. Calculated thermal low setpoint

Screen 3/3 :

1.	Influences
2.	D/N Period > D.
3.	Dehumidification > xx

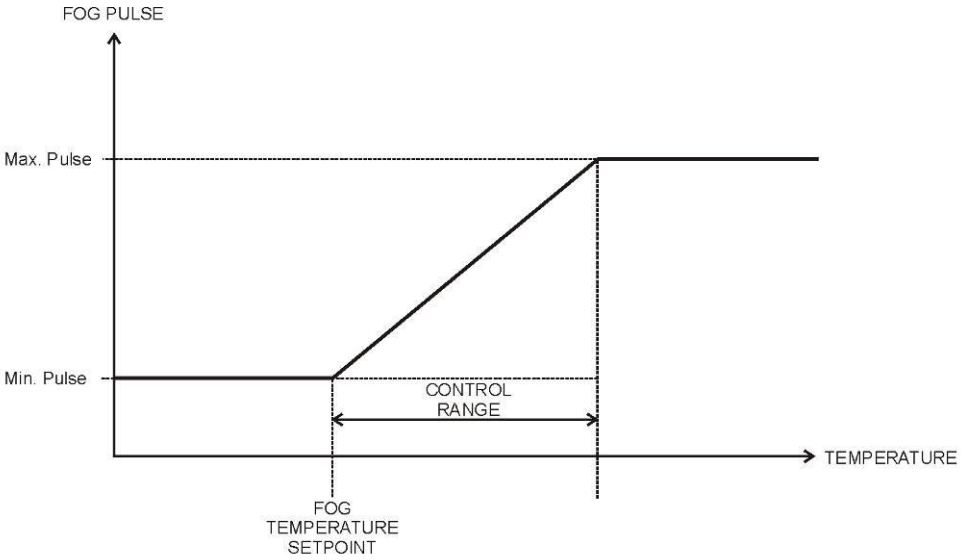
1.
2. Daytime period (day/night or active period number)
3. Dehumidification in process ? (━ : no / ✔ : yes)

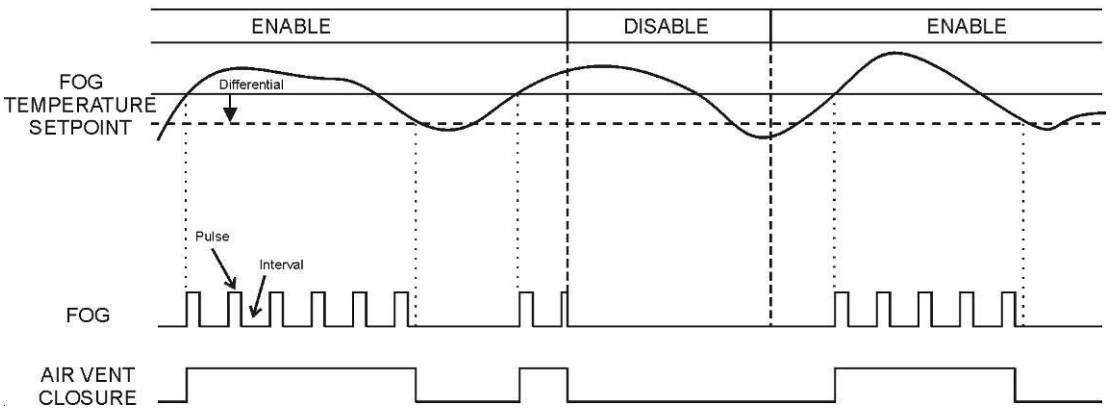
3.7. Fog operation

3.7.1. Principle

Fogging can operate according to the temperature ("Cooling" function) or humidity ("Humidification" function). In both cases control is based on a setpoint with an adjustable differential and a start and end time between which operation is enabled. If necessary, the regulator controls fogging by pulse and interval. The pulse value depends on the difference between the setpoint and the measurement. The interval between the pulses is fixed.

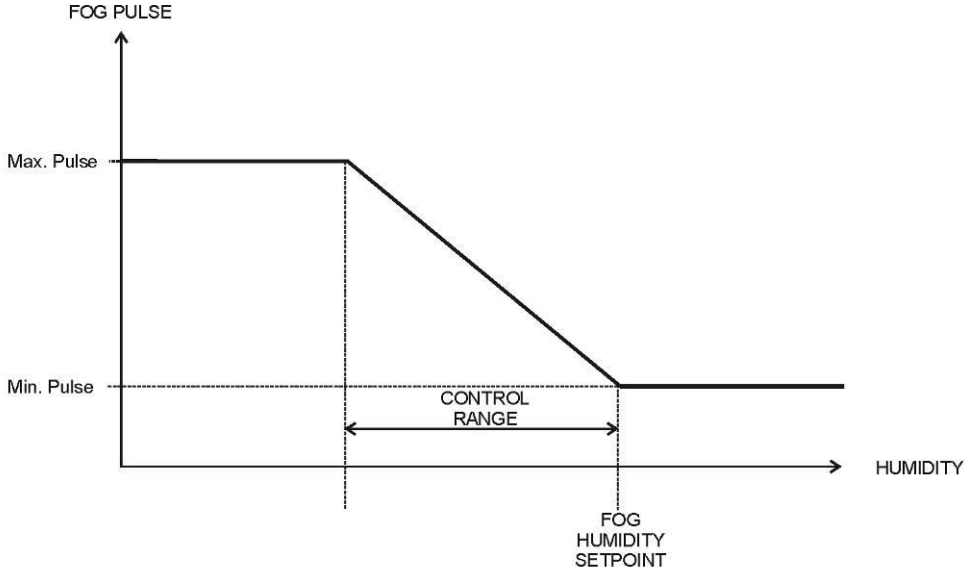
- Operation in temperature mode:

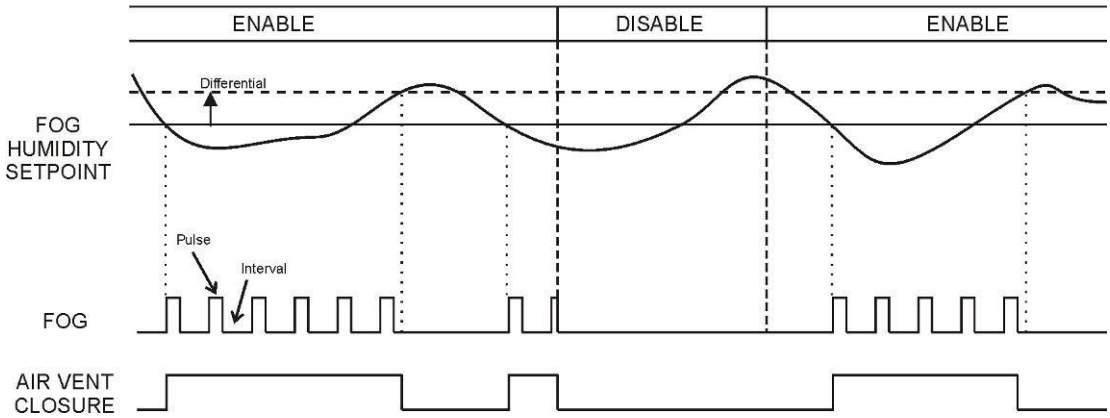




When the humidity exceeds the "Humidity safety setpoint", start-up of fogging in temperature mode is disabled.

- Operation in Humidity mode:





When the temperature is less than the "Temperature safety setpoint", start-up of fogging in humidity mode is disabled.

In both cases, forced closure can be imposed on the air vents when fogging is operating.

3.7.2. Parameters

Note:
- the symbol means that the menu opens after a long press
- In some cases parameters may be masked; see the corresponding notes at the end of the list of parameters.

Setpoints Menu ➔ Fog

AH01	Temperature Setpoint		
Fogging high temperature setpoint Air temperature above which the regulator starts up fogging (100.0°C=No)		Min. Max. Default	***-9.9 °C*** ***99.9 °C*** ***30.0 °C***

AH02	Hygrometry Security		
Humidity safety point in temperature mode Air humidity above which the regulator disables start-up of fogging in temperature mode		Min. Max. Default	***0 %*** ***100 %*** ***No (=101%)***

AH03	Hygrometry Setpoint		
Fogging low humidity setpoint Air humidity below which the regulator starts up fogging (101%=No)		Min. Max. Default	***0 %*** ***100 %*** ***50%***

AH04	Temperature Security		
Temperature safety setpoint in humidity mode Air temperature below which the regulator disables start-up of fogging in humidity mode		Min. Max. Default	***-9.9 °C*** ***99.9 °C*** ***No (=100.0°C)***

Fog Menu➔ Temp. Funct.

LA01	Fog Start Time		
Fog operation start time in temperature mode		Min.	***00h00***
Time from which the regulator can enable fog operation in temperature mode		Max.	***23h59***
		Default	***00h00***

LA02	Fog End Time		
Fog operation end time in temperature mode		Min.	***00h00***
Time from which the regulator can no longer enable fog operation in temperature mode		Max.	***23h59***
		Default	***23h59***

LA03	Temp. Differential		
Fog differential in temperature mode		Min.	***0.5 °C***
Value which, subtracted from the fog setpoint in temperature mode, gives the fog OFF setpoint		Max.	***10.0 °C***
		Default	***1 °C***

LA04	Hygro. Differential		
Humidity safety differential		Min.	***2 %***
Value which, subtracted from the humidity safety setpoint, gives the humidity safety OFF setpoint		Max.	***20 %***
		Default	***10 %***

LA05	Control Range		
Fog regulation range in temperature mode		Min.	***1.0 °C***
Zone above the fog setpoint in temperature mode in which fog pulses are proportional to the temperature		Max.	***50.0 °C***
		Default	***5.0°C***

LA06	Mini Pulse Duration		
Minimum duration of fog pulses in temperature mode		Min.	***0 s***
Minimum fog ON time in temperature mode during the operating period		Max.	***LA07***
		Default	***5 s***

LA07	Maxi Pulse Duration		
Maximum duration of fog pulses in temperature mode		Min.	***LA06***
Maximum fog ON time in temperature mode during the operating period		Max.	***999 s***
		Default	***30 s***

LA08	Interv. between Pulse		
Interval between fog pulses in temperature mode		Min.	***0 s***
Fog OFF time in temperature mode during the operating period		Max.	***9999 s***
		Default	***60 s***

Fog Menu➔ Humid. Function

LB01	Fog Start Time		
Fog start time in humidity mode		Min.	***00h00***
Time from which the regulator can enable fog operation in humidity mode		Max.	***23h59***
		Default	***00h00***

LB02	Fog End Time		
Fog end time in humidity mode		Min.	***00h00***
Time from which the regulator can no longer enable fog operation in humidity mode		Max.	***23h59***
		Default	***23h59***

LB04	Hygro. Differential		
Fog differential in humidity mode		Min.	***2 %***
Value which, added to the humidity setpoint, gives the fog OFF setpoint in humidity mode		Max.	***20 %***
		Default	***10 %***

LB03	Temp. Differential		
Temperature safety setpoint differential		Min.	***0.5 °C***
Value which, added to the temperature safety setpoint, gives the temperature safety OFF setpoint		Max.	***10.0 °C***
		Default	***1 °C***

LB05	Control Range		
Fog regulation range in humidity mode		Min.	***5%***
Zone below the fog setpoint in humidity mode in which fog pulses are proportional to the humidity		Max.	***50%***
		Default	***20%***

LB06	Mini Pulse Duration		
Minimum duration of fog pulses in humidity mode		Min.	***0 s***
Minimum fog ON time in humidity mode during the operating period		Max.	***LB07***
		Default	***5 s***

LB07	Maxi Pulse Duration		
Maximum duration of fog pulses in humidity mode		Min.	***LB06***
Maximum fog ON time in humidity mode during the operating period		Max.	***999 s***
		Default	***30 s***

LB08	Interv. between Pulse		
Interval between fog pulses in humidity mode		Min.	***0 s***
Fog OFF time in humidity mode during the operating period		Max.	***9999 s***
		Default	***60 s***

Fog menu ➔ Influences

LC01	Ventilation Influence

Influence on air vents
Used to force closing by a given percentage during fogging

Min. ***Yes***
Max. ***No***
Default ***No***

3.7.3. Reading screens

Reading Menu ➔ Fog (next : ⊘ or ⊕ to change screen)

Screen 1/2 :

1.	Air Temp° > +xx.x°C
2.	Temp° Setp. > +xx.x°C
3.	Hygrometry > xxx%
4.	Hygro Setp. > xxx%
5.	Status > xxxxxxx
6.	Temporizing > xx:xx

1. Measured ambient temperature
2. Calculated running setpoint for temperature
3. Measured ambient hygrometry
4. Calculated running setpoint for hygrometry
5. Fog status : Run or Stop
6. Temporization (pulse or interval)

Screen 2/2 :

1.	Influences
2.	Active Period > xx

1.
2. Active period number

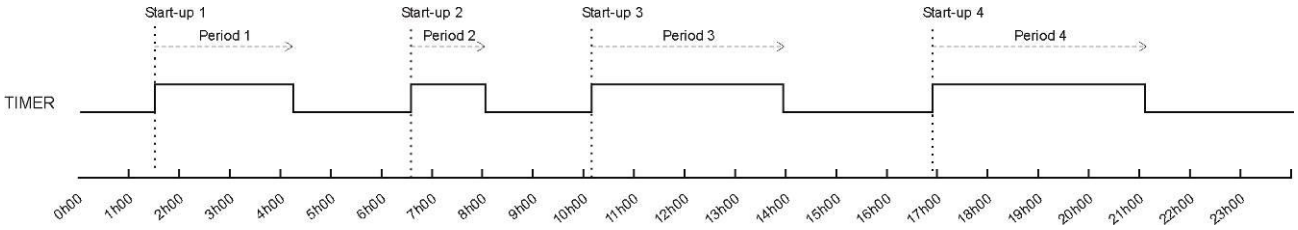
3.8. Operation of the timer

3.8.1. Principle

- Operation at set times

The timer output can be activated at 4 set times each day.
The periods of operation after each activation can be set independently but they must all be either in seconds or minutes.

The graph below shows the operation of the timer:

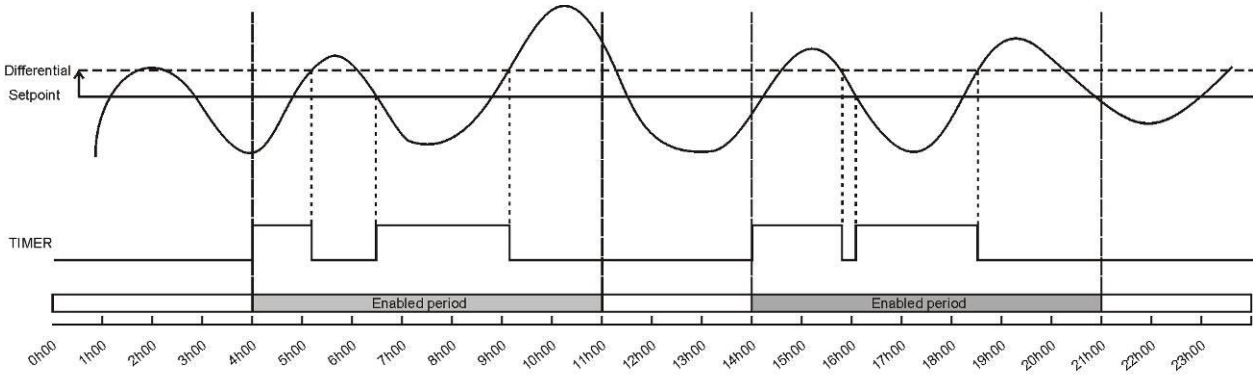


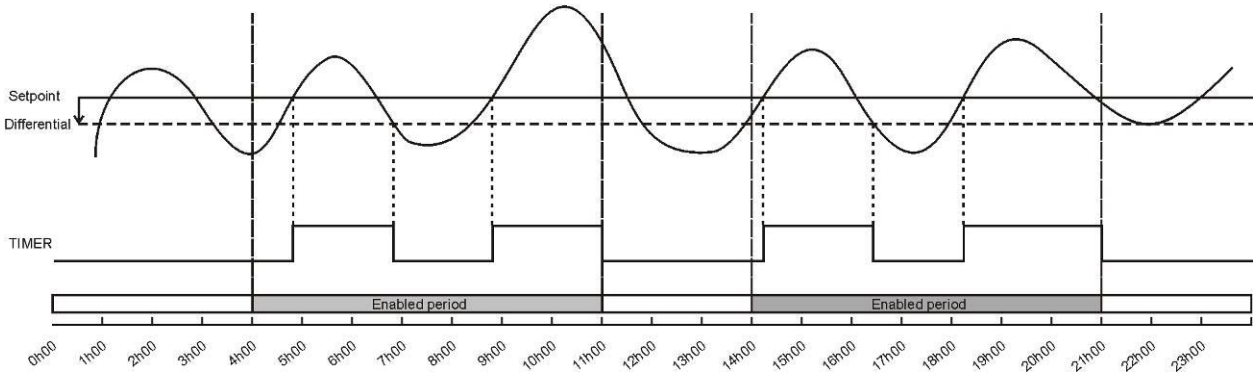
- Conditional operation

It is also possible to define a sensor to condition the operation of the timer.
In this mode, in addition to the 4 start-ups each day, timer operation will be conditioned by a measurement (temperature, humidity, light intensity (Lux), etc.) compared against a setpoint and adjustable positive or negative differential according to the required function:

- A positive differential activates the output when the measurement is below the setpoint.
- A negative differential activates the output when the measurement is above the setpoint.

This mode can be disabled outside two daily operating time slots, as shown below:





Some examples of use:

- To control an air-conditioning system according to ambient temperature:
  1. Select the "Temperature" condition,
  2. Set a negative differential,
  3. Set the time slots (e.g. operating only during the day),
  4. Set the setpoint.

- To control a lighting system:
  1. Select the "Lux" condition,
  2. Set a positive differential,
  3. Set the time slots (e.g. operating only during the night),
  4. Set the setpoint,
  5. If necessary, set a minimum waiting time between two start-ups.

3.8.2. Parameters

Notes:

- the symbol means that the menu opens after a long press,
- in some cases parameters may be masked; see the corresponding notes at the end of the list of parameters.

Setpoint Menu ➔ Clock

AI01	Clock Setpoint	(1)

Measurement setpoint for the timer
Value below which (or above which) the timer will be activated when the measurement condition is used.
The minimum, maximum and default values depend on the type of condition chosen:

Min.:
Max.
Default:

Influence	*Min*	*Max*	*Default*
Temperature	-9.9 °C	+99.9 °C	25.0 °C
Hygrometry	0 %	100 %	50 %
Sunniness	0 W/m²	1500 W/m²	300 W/m²
Luminosity	0 Lux	100.000 Lux	2000 Lux
CO2	0 ppm	5000 ppm	2000 ppm

Clock Menu ➔ Operation

MA01	Functioning Unit

Operating unit for the timer
Used to set the timer operating period after each of the 4 start-ups.

Min.: ***SECONDS***
Max. ***MINUTES***
Default: ***SECONDS***

MA02	P1 Starting Time

Start time for Period 1
Time when the timer is activated for period 1

Min.: ***00.00***
Max. ***23.59***
Default: ***00.00***

MA03	P1 Running Duration

Operating time for Period 1
Time during which the timer operates for period 1 (in seconds or minutes depending on unit chosen)

Min.: ***0***
Max. ***999***
Default: ***0***

MA04	P2 Starting Time

Start time for Period 2
Time when the timer is activated for period 2

Min.: ***00.00***
Max. ***23.59***
Default: ***00.00***

MA05	P2 Running Duration

Operating time for Period 2
Time during which the timer operates for period 2 (in seconds or minutes depending on unit chosen)

Min.: ***0***
Max. ***999***
Default: ***0***

MA06	P3 Starting Time

Start time for Period 3
Time when the timer is activated for period 3

Min.: ***00.00***
Max. ***23.59***
Default: ***00.00***

MA07	P3 Running Duration

Operating time for Period 3
Time during which the timer operates for period 3 (in seconds or minutes depending on unit chosen)

Min.: ***0***
Max. ***999***
Default: ***0***

MA08	P4 Starting Time

Start time for Period 4
Time when the timer is activated for period 4

Min.: ***00.00***
Max. ***23.59***
Default: ***00.00***

MA09	P4 Running Duration

Operating time for Period 4
Time during which the timer operates for period 4 (in seconds or minutes depending on unit chosen)

Min.: ***0***
Max. ***999***
Default: ***0***

Clock Menu ➔ Influence

MB01	Measurement Influence

Measurement used as condition

Min.: ***None***
Max. ***Lux***
Default: ***None***

None	No condition
Temp°	Ambient temperature used as condition
Hygro	Ambient humidity used as condition
Watt/m²	Sunlight used as condition
Lux	Light intensity used as condition
CO2	CO2 level used as condition

MB02	Measurement Differ.	(1)

Measurement differential for the timer

Value subtracted from or added to the measurement setpoint to provide the timer stop setpoint.
The minimum, maximum and default values depend on the type of condition:

Min.:
Max.
Default:

Condition	*Min.*	*Max.*	*Default*
Temperature	–9.9 °C	+9.9 °C	1.0 °C
Humidity	–20 %	+20 %	10%
Sunniness	–999 W/m²	+999 W/m²	100 W/m²
Luminosity	–9999 Lux	+9999 Lux	500 Lux
CO2	–999 ppm	+999 ppm	500 ppm

MB03	P1 Measur. Start Time	(1)

Measurement start time for period 1

Time during period 1 when the measurement becomes active

Min.: ***00.00***
Max. ***MB04***
Default: ***00.00***

MB04	P1 Measur. End Time	(1)

Measurement end time for period 1

Time during period 1 when the measurement is deactivated

Min.: ***MB03***
Max. ***24.00***
Default: ***12.00***

MB05	P2 Measur. Start Time	(1)

Measurement start time for period 2

Time during period 2 when the measurement becomes active

Min.: ***12.00***
Max. ***MB06***
Default: ***00.00***

MB06	P2 Measur. End Time	(1)

Measurement end time for period 2

Time during period 2 when the measurement is deactivated

Min.: ***MB05***
Max. ***24.00***
Default: ***24.00***

MB07	Minimum Interv. Tempo	(1)

Minimum timer gap

Minimum waiting time between two successive timer activations

Min.: ***00.00***
Max. ***03.00***
Default: ***00.00***

Notes: Parameter visible:
(1) If "MB01 is other than "NONE".

3.8.3. Reading screens

Reading Menu ➔ Clock (next : ⊘ or ⊘ to change screen)

Screen 1/2 :

1.	Status > xxxxxxx
2.	xx:xx (xxxxxxxxxx)
3.	P1 > xx:xx > xx:xx:xx
4.	P2 > xx:xx > xx:xx:xx
5.	P3 > xx:xx > xx:xx:xx
6.	P4 > xx:xx > xx:xx:xx

1. Clock status : Run or Stop
2. Actual time and functioning mode of clock
3. Beginning and end functioning times for period 1
4. Beginning and end functioning times for period 2
5. Beginning and end functioning times for period 3
6. Beginning and end functioning times for period 4

Screen 2/2 :

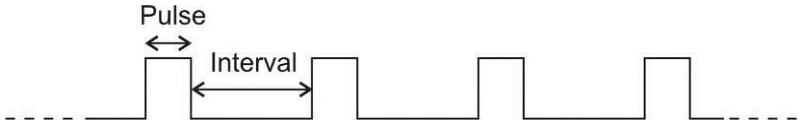
1.	Influences
2.	Active Period > xx
3.	Measuring >xxxxxxxxx
4.	Run. Setp.>xxxxxxxxx
5.	Stop. Setp.>xxxxxxxxx
6.	Waiting Time > xx:xx

1.
2. Active period number
3. Influence measurement
4. Running setpoint for influence measurement
5. Stop setpoint for influence measurement
6. Temporization between two successive starts

3.9. Inflation operation

3.9.1. Principle

Inflation is managed by the pulse and interval principle (for example 30 seconds on and 20 minutes off)



If there is a strong wind, the pulse duration is automatically increased (multiplied by the over-inflation coefficient) but the interval duration does not change.

3.9.2. Parameters

Notes :
- the symbol 🔒 means that the menu opens after a long press
- in some cases parameters may be masked; see the corresponding notes at the end of the list of parameters

Inflation Menu ➔ Operation

IA01	Pulse Duration

Duration of inflation pulses
Inflation "ON" time

Min : ***0 s***
Max : ***999 s***
Default : ***30 s***

IA02	Interv. between Pulse

Interval between inflation pulses
Inflation "OFF" time

Min : ***0 min***
Max : ***60 min***
Default : ***30 min***

Inflation Menu ➔ Constructor 🔒

IX01	Over-inflation Coeff.

Over-inflation coefficient
Value used to increase the inflation pulse duration during strong wind

Min : ***1.0***
Max : ***2.0***
Default : ***1.5***

3.9.3. Reading screens

Reading Menu ➔ Inflation

1.	Status > xxxxxxx
2.	
3.	Temporizing > xx:xx
4.	Over-inflation> xxx

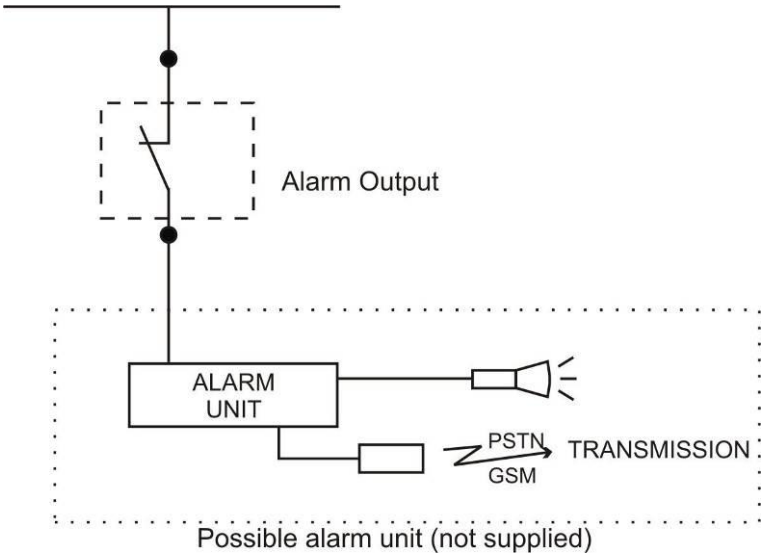
1. Inflation status : Run or Stop
2.
3. Temporization (pulse or gap)
4. Over-inflation in case of strong wind ? (━ : no / ✔ : yes)

3.10. Alarm operation

3.10.1. Principle

IMPORTANT:
In some configurations, the regulator may not have an "alarm" output (see section "Power supply and output connections").
In this case, the alarms are displayed but no output is activated.

If the regulator is fitted with an alarm relay, the relay contacts are closed when no alarm is detected (NC contact).



The alarm relay is activated by measurements made by the regulator.
Even if this function is fitted, the user must still set up an external electrical safety device (e.g. thermostat, etc.)

- Probes

For any suitable probe connected to the analogue inputs, regulator provides:
- 1 high threshold
- 1 low threshold

In addition a trigger delay timer (common to all the probes) prevents accidental activation of the alarm.

The regulator also triggers an alarm there is a problem on a probe (disconnected or short-circuited).

- Network

When it is configured to "Slave" mode, the regulator generates an alarm if it receives no data from the "Master" for at least 30 seconds.

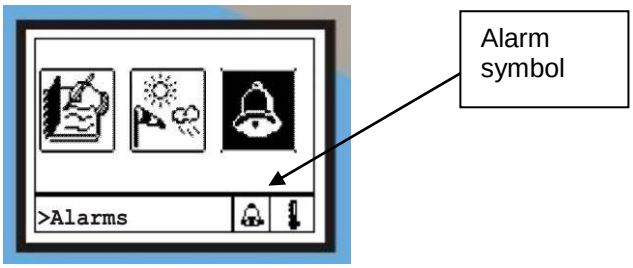
- Inflation

If the regulator includes the "Inflation" function, it is possible to set a maximum period of use in manual mode (using the R9 output switch). If the user actuates the inflation control deliberately during this period, the regulator triggers an alarm.

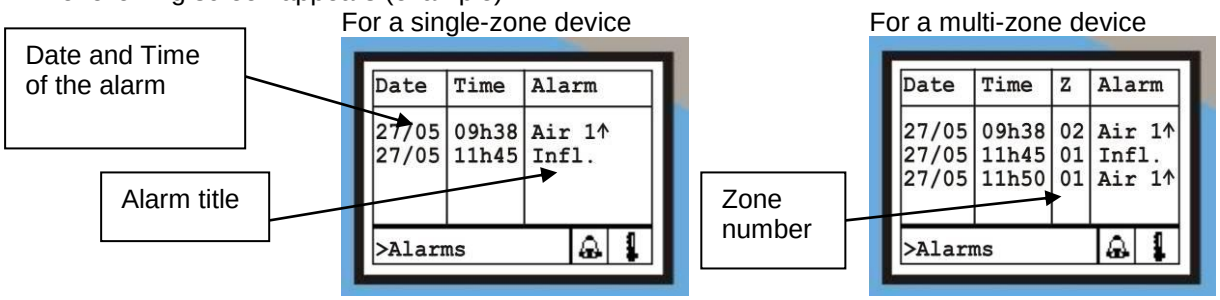
3.10.2. Display and Acknowledgement of Alarms

When an alarm occurs, the symbol flashes at the bottom right of the screen and the regulator emits a series of beeps.

After this warning, use the keys to access the alarm menu via the icon .



The following screen appears (example):



To select a line, use keys and .

To acknowledge an alarm, use the key ✱

To return to the previous screen, use the key ⮌

Before acknowledging an alarm, check that the problem is solved, otherwise the alarm will reappear.

Meaning of the alarm titles:

Air x ↑	High alarm on ambient temperature probe no. x
Air x ↓	Low alarm on ambient temperature probe no. x
Air x ?	Problem on ambient temperature probe no. x (disconnected or short-circuited)

Wat x ↑	High alarm on water temperature probe no. x
Wat x ↓	Low alarm on water temperature probe no. x
Wat x ?	Problem on water temperature probe no. x (disconnected or short-circuited)

Soi x ↑	High alarm on ground temperature probe no. x
Soi x ↓	Low alarm on ground temperature probe no. x
Soi x ?	Problem on ground temperature probe no. x (disconnected or short-circuited)

RH x ↑	High alarm on humidity probe no. x
RH x ↓	Low alarm on humidity probe no. x
RH x ?	Problem on humidity probe no. x (disconnected or short-circuited)

Infl.	Manual inflation alarm
Netwo.	Network in "Slave" mode alarm

3.10.3. Parameters

Setpoints Menu ➔ Alarms

For each connected internal sensor:

AK01	Al. High xxxxxx

High alarm for indicated sensor (xxxxxx)
Value above which the regulator activates the alarm relay.
To inhibit this alarm: set a value greater than the maximum.

Min : ***AK02***
Max : ***sensor specific***
Default : ***sensor specific***

AK02	Al. Low xxxxxx

Low alarm for indicated sensor (xxxxxx)
Value below which the regulator activates the alarm relay.
To inhibit this alarm: set a value lower than the minimum.

Min : ***sensor specific***
Max : ***AK01***
Default : ***sensor specific***

For the inflation function:

AK09	Tpo Inflation+Manual

Inflation time under manual operation
Maximum operating time of inflation in manual mode before the regulator activates the alarm relay
Set above 999 minutes to inhibit this alarm.

Min : ***0 min***
Max : ***999 min***
Default : ***10 min***

Alarms Menu ➔ Operation

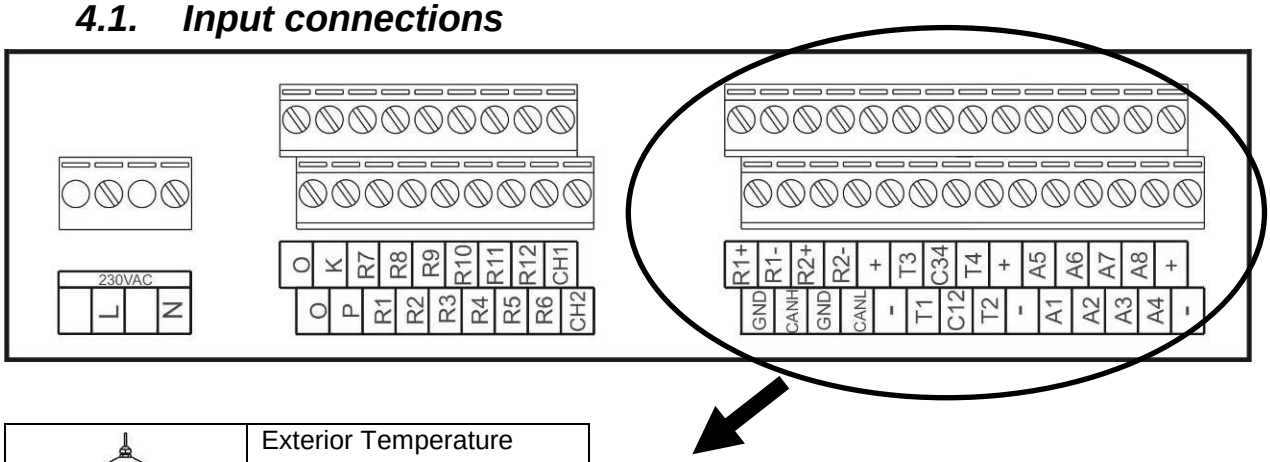
GA01	H & L Alarms Tempo.

High and low alarm temporizing
Minimum time that a high or low alarm must be present before the regulator activates the alarm relay

Min : ***0 s***
Max : ***999 s***
Default : ***30 s***

4. CONNECTION PRINCIPLE

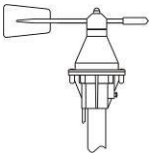
4.1. Input connections

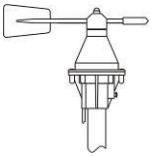


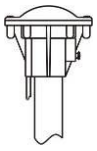
	Exterior Temperature	
	White	A1
	Blue	–

	Interior Temperature	
	White	A2
	Blue	–

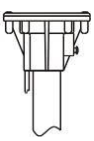
	Interior Hygrometry	
	White	+
	Blue	A6

	Wind Vane 0-360°	
	White	+
	Blue	A5

	Wind Vane both sides	
	Blue	+
	Red	T3
	White	T4

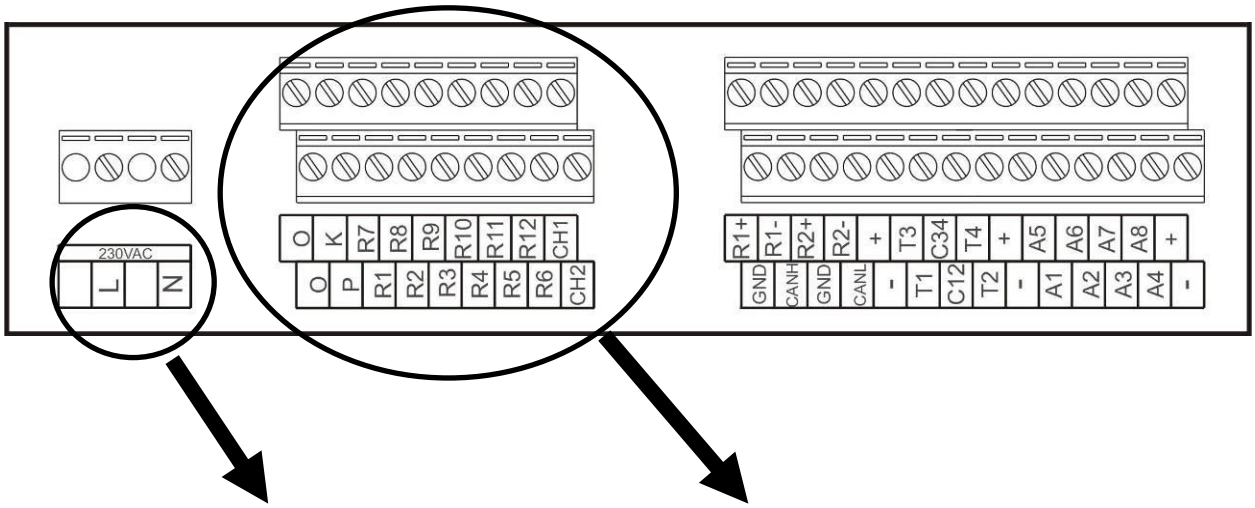
	Luminosity / Sunniness 0-100.000 Lux 0-1.500 Watt/m²	
	Blue	+
	Red	A7
	White	A8

	Anemometer	
	White	+
	Blue	T1

	Rain Stand-alone	
	White	+
	Blue	T2
	Red	CH1
	Yellow	CH2

The + terminals are for the 15 VDC from the PCB
The – terminals are for the 0 VDC from the PCB

4.2. Connection of power supply and outputs



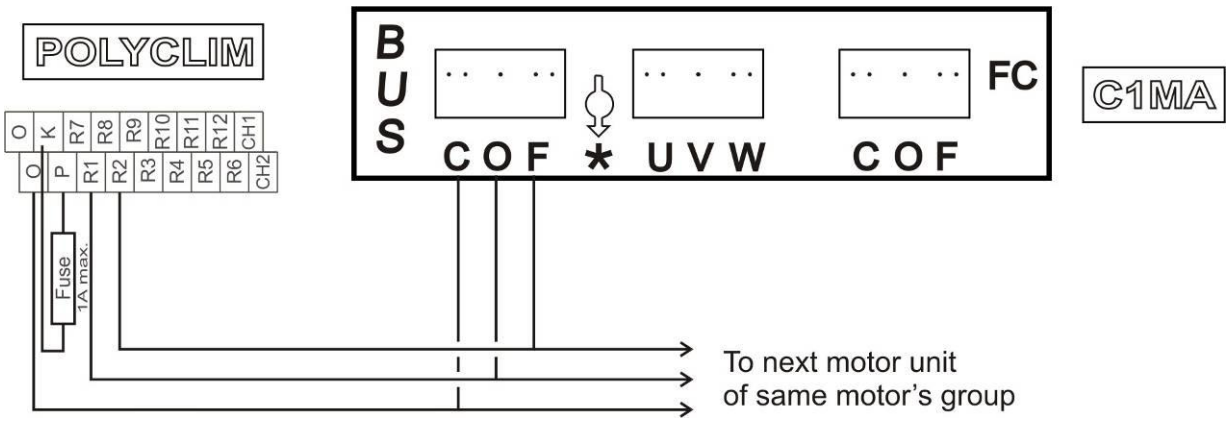
230VAC power supply live	L
230VAC power supply neutral	N

24VAC Output (25VA max.)	O
24VAC Output (25VA max.)	P

Opening Ventilation 1	R1
Closing Ventilation 1	R2
Opening Ventilation 2	R3
Closing Ventilation 2	R4
Opening Shade	R5
Closing Shade	R6
Fog	R7
Timer	R8
Inflation	R9
Thermostatic Heating	R10
Air Mixer	R11
Alarm (N.C. contact)	R12
Output Common	K

The PCB power supply must be protected by a Gg 1A fuse or a Curve C 1A circuit breaker.
The outputs are « 24 V, 1 A max ».
Terminal K is common to all outputs

- Direct connections to motor units type C1MA, C1MA/SA/AUTO, C1MG, C1MC, …



5. CHARACTERISTICS AND PRECAUTIONS

5.1. General characteristics

SUPPLY VOLTAGE:	230VAC single-phase 50/60 Hz
VOLTAGE TOLERANCE:	+/–10%
CONSUMED POWER:	50VA maxi
OUTLETS:	Dry contacts maximum 5A/24V
WEIGHT:	Approx. 2 kg
DIMENSIONS:	L = 220 mm / H = 260 mm / D = 80 mm
PROTECTION:	IP445
STORAGE TEMPERATURE:	–10°C to +60°C
TEMPERATURE OF USE:	0°C to 50°C
AIR HUMIDITY:	Maximum 93% without condensation

5.2. WARNING installation safety

Climate regulation devices installed in a greenhouse do not contain independent alarm devices.
In the event of malfunction caused by the general installation (mechanical or electrical components, cables, probes, weather sensors, regulation system electronics, operating error, etc.), a climate regulator or computer cannot be considered to be a safety device capable of rendering the installation safe or alerting the greenhouse user.
To guarantee the safety of greenhouse, you must install an independent, standalone alarm unit with its own detectors (such as VIGICLIM or equivalent) capable of triggering real-time alarms and providing event traceability.
The manufacturer draws greenhouse owners' and/or users' attention particularly to the fact that regulation systems operate in "open loop" configuration and therefore do not monitor the real position of vents but only a calculated theoretical position.
In addition, special care must be given to preventive maintenance of equipment, especially weather probes and sensors.
Periodic inspections and tests are essential for checking the reliability of alarm unit equipment and sensors.
The manufacturer is only liable for damage resulting from an operating fault on its equipment being used for its designed climate regulation function and provided that installation, operation and servicing standards are observed.

5.3. Precautions for use

- Avoid direct sun exposure.
- Avoid water spraying.
- Avoid shocks.
- Avoid excessive pressure on keys.
- Do not open the device; in this instance, the warranty does not apply.
- Do not connect or disconnect a sensor or an outlet without shutting off power.
- Do not connect a sensor other than those specified in documentation.

These devices must be installed by authorized technicians. Follow the precautions for installation and use; otherwise, warranty shall not apply.

5.4. Precautions for installation

Important instructions for the installation of devices with microprocessor.

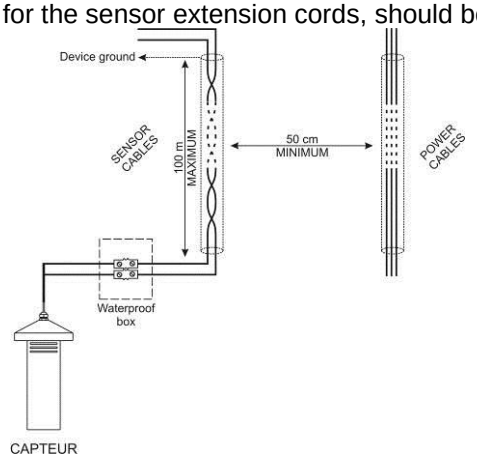
- Changes in the supply system are only allowable within the specified tolerances (install a voltage regulator or an inverter, if required).
- Protection of the device against lightning surges (surge diverters) and against phase inversions (checking relay) is recommended
- In the event of interference systems (e.g., thyristor controls), it is recommend that the device be supplied through a separate transformer.
- Do not install the devices under high-voltage power lines.
- Do not position sensor or signal cables near control and power cables (required minimum distance: 50 cm).
- Use shielded measuring lines as much as possible and ground them at one end on the side of the controller.
- Install power circuits at a sufficient distance from electronic devices.
- If inductive circuits, such as contactors, solenoid valves, etc., are installed near the device, it is essential to suppress their coil with RC filters.
- Do not connect control circuits (relays, contactors) on the quick-connect terminals to the supply circuit of the device.
- The supply of the devices using a generating unit requires special precautions, in particular:
    - Make the connection to the generating unit when the unit is in steady-state condition.
    - Set the generating unit to ensure a 230V supply of the devices within the specified tolerances (230VAC ± 10%, 50 or 60Hz).
- Use an appropriate screwdriver to connect the wires to the device terminal board. Maximum sectional area of wires: 1.5 mm^2, maximum 2 wires per terminal.
- Make sure to wire the star-shaped ground conductor.

Important instructions for the installation and maintenance of sensors.

- Do not position sensor or signal cables near control and power cables (required minimum distance: 50 cm).
- Maximum length of sensor cables:
    - temperature and hygrometry sensors: 100 meters
    - Weather sensors: 10 meters

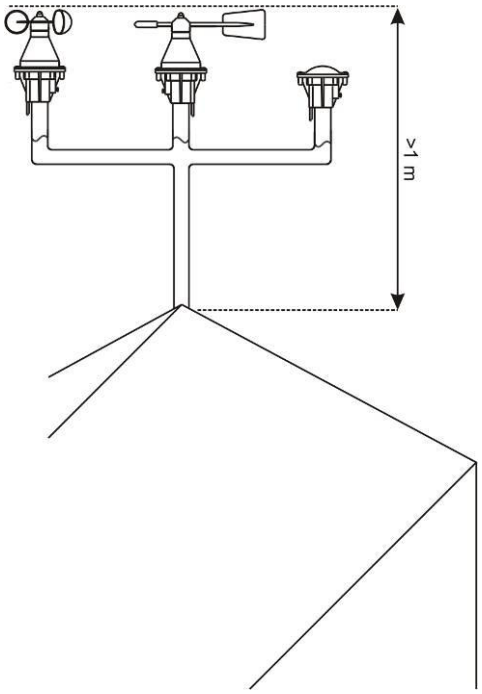
- If extension cords are necessary, use shielded twisted pair cable (the shield should be linked to one end to the ground of the controller)

- The junction boxes used for the sensor extension cords, should be waterproof.



- Connect weather sensors and probes to a dead controller.

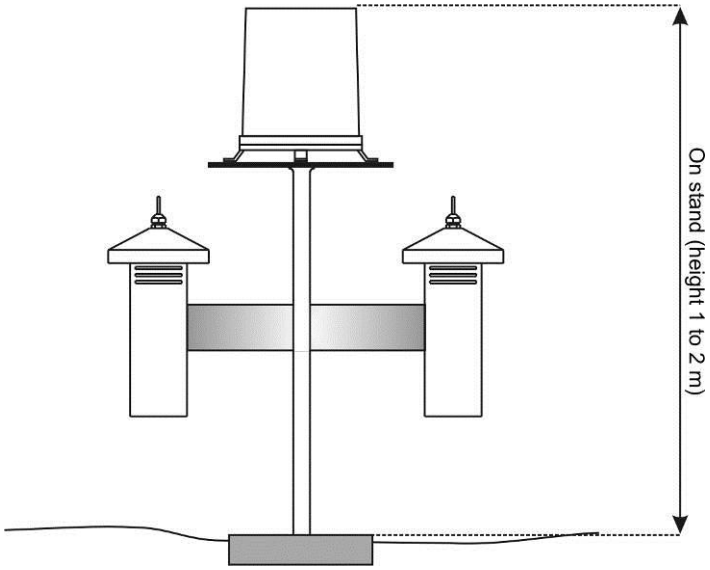
- The "Weather" sensors should be:
  - installed on 1 mast at 1 meter above the greenhouse structure on the side of the "prevailing wind",
  - protected against turbulence and dust,
  - away from disturbing sources (high mast lighting structure, high-voltage power lines, etc.),
  - checked and cleaned on a regular basis (without scratching sensor surface).



- The ambient temperature sensor is usually hung in the middle of the greenhouse (avoid areas with air drafts).

- The hygrometry sensor, which is also installed in the middle of the greenhouse, should be protected as much as possible against treatment products. Clean and recondition the sensor on a regular basis.

- If the Watt/m² or Lux sensors are installed inside the greenhouse, avoid cast shadows related to the greenhouse structure.
- Check and clean the filter of ventilated sensors weekly.
- Direct the weathervane properly.
- Install the pluviometry, temperature and external hygrometry sensors on a stand, in a site that was cleared on a 10 m ray, avoiding ventilated areas. The stand must be well secured in the ground (mass concrete or equivalent).



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